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JOURNAL OF THE PROCEEDINGS
OF THE
BOARD OF INTERNAL IMPROVEMENTS,

IN THE
STATE OF MISSOURI,

Begun and held at the City of St. Louis, on the 6th of May, 1839.

At the first meeting of the "Board of Internal Improvements," in the State of Missouri, convened according to law, by appointment of the Governor, at the City of Saint Louis, on Monday, the 6th day of May, in the year of our Lord, one thousand eight hundred and thirty-nine, the following Directors, duly appointed and commissioned, appeared, and took their seats, to wit:

George C. Sibley, of St. Charles county.

Hugh Meredith of Monroe county.

Benj. F. Robinson, of Cole county.

Absent—Cornelius Davy, of Jackson county, and Robert White, of Scott county.

On motion of Mr. Meredith, Geo. C. Sibley was appointed temporary Chairman, and Mr. J. O. Gamble, temporary Secretary.

Mr. Meredith then moved an adjournment till 10 o'clock, to-morrow morning, to wait the arrival of Messrs. Davy and White, which was agreed to, and the meeting was adjourned accordingly.

Tuesday, May 7th.

The meeting as adjourned yesterday, took place this morning at 10 o'clock.

Present—The same Directors as on yesterday. Messrs. Davy and White not yet appearing to take their seats, it was moved by Mr. Meredith, as an act of courtesy to those gentlemen, to adjourn till 10 o'clock to-morrow morning, and then proceed to organise the Board, according to law, which motion was agreed to, and the adjournment took place accordingly.

Wednesday morning, May 8th.

Messrs. Sibley, Meredith, and Robinson, the Directors present on yesterday and the day before, met again this morning pursuant to adjournment. Messrs. Davy, of Jackson, and White, of Scott, still absent.

The three Directors present, being "a quorum for the transaction of business," determined unanimously, to proceed to the organization of the Board, and to the transaction of business without any further delay; nothing having been heard from the two absent Directors.

On motion of Mr. Meredith, and the concurrence of Mr. Robinson, Geo. C.

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Sibley, the Director from St. Charles county, was duly appointed President of the Board for two years, and immediately took his seat as President.

Messrs. Sibley, Meredith, and Robinson, then filed their official oaths respectively, (taken before the Mayor of St. Louis,) as required by law, which were ordered to be recorded, and then transmitted to the Secretary of State.

On motion of Mr. Robinson, the Board proceeded to determine by lot, as by law required, the time which each Director now appointed, shall hold his office; and it was in due form determined, that Hugh Meredith, Robert White, and Cornelius Davy, shall each hold his office for the term of two years—and that Benjamin F. Robinson and George C. Sibley shall each hold his office for four years.

The President laid before the Board communications in writing from the Governor, containing his nominations of William H. C. Bartlett, and William H. Morell, one of whom, at the option of the Board, to be Chief Engineer of the State of Missouri. The Board, on motion of Mr. Meredith, proceeded immediately to consider the said nominations. Of Mr. Bartlett's wishes in relation to this appointment, the Board were entirely uninformed.

Mr. Morell signified in person, his willingness to accept, and presented such testimonials of his qualifications for the office of Chief Engineer, as were entirely satisfactory to the Board, whereupon, on motion of Mr. Robinson, the Board unanimously consented to the appointment of William H. Morell, to be Chief Engineer of the State of Missouri; and directed that the President inform the Governor of said confirmation.

On motion of Mr. Meredith, the Board unanimously agreed to fix the salary of the Chief Engineer at *two thousand dollars* per annum, payable quarterly, from this day, and recommend the same to the Governor for his approval.

Adjourned till 9 o'clock, to-morrow morning.

Thursday, May 9th.

The Board met pursuant to adjournment.

Present—Messrs. Sibley, President, Meredith, and Robinson.

Mr. Cornelius Davy, of Jackson county, a Director duly appointed and commissioned, appeared, filed his official oath, and took his seat as a member of the Board. Mr. White, of Scott, still absent and unheard from.

On motion of Mr. Robinson, John H. McMillan, of St. Louis, was appointed Secretary of the Board of Directors, who after being duly qualified, entered immediately upon the duties of said office.

On motion of Mr. Robinson, it is ordered by the Board, that the Secretary of this Board shall receive as compensation for his services during the sessions of the Board, *five dollars* per day, when in attendance, and also an allowance of *one hundred dollars* per annum for office rent and extra services.

On motion of Mr. Robinson, it is ordered that the Secretary procure such books and stationery as are requisite for recording the proceedings of the Board in a permanent manner, for keeping the accounts and other records by law required, and such as may be necessary under the direction of the Board and President, to the transaction of the business of the Board from time to time.

On motion of Mr. Meredith, it is ordered by the Board, that the Chief Engineer shall have authority, in conjunction with the Commissioners of the Board respectively, to employ in his Department, two assistant Engineers—two Surveyors—two Rodmen—two Flagmen—four Chainmen—four Axemen—two Cooks, and such other aids as may be necessary, having a due regard to economy, to promote the service; and he shall be authorised to allow the following *maximum* rates of compensation for faithful services, to wit:

To the assistant Engineers—*twelve hundred and fifty dollars per annum.*
 To the Surveyors—*sixty dollars per month.*
 To the Rodmen—*forty-five dollars per month.*
 To the Flagmen—*thirty dollars per month.*
 To the Chainmen, Axemen, Cooks, and other common hands, *twenty dollars per month.*

And the said Chief Engineer shall also be authorised in conjunction as aforesaid, to procure all the instruments, implements, tents, camp furniture, transportation, &c., that may from time to time be necessary to advance the service.

Adjourned till to-morrow morning, 10 o'clock.

Friday, May 10th.

The Board met pursuant to adjournment.

Present—Messrs. Sibley, President, Meredith, Davy, and Robinson. Mr. White still absent.

On motion of Mr. Robinson, it is ordered by the Board, that the sum of *one thousand dollars* be placed in the hands of Wm. H. Morell, the Chief Engineer, for the purchase of such instruments, implements, stationery, tents, &c., necessary to fit out and organise for active service, two field parties for making surveys and reconnoissances, under the superintendence of such Commissioner or Commissioners as this Board may direct.

On motion of Mr. Meredith, it is ordered by the Board, that Cornelius Davy be appointed Commissioner of this Board, to superintend the survey and reconnoissance of the North Grand River. That B. F. Robinson be appointed Commissioner to superintend the survey of the Osage River. That Hugh Meredith be appointed Commissioner to superintend the survey of Salt River. That Geo. C. Sibley and Robert White be appointed Commissioners of the Board to superintend the survey and reconnoissance of the Merrimac River, and a route for a Rail Road from the City of St. Louis to the Iron Mountain.

That the said Sibley and White may make such division of the labor hereby assigned to them, as they may agree upon. And that each Commissioner be authorised to call in the advice and assistance of one or more of his colleagues, when he may deem it necessary and expedient.

On motion of Mr. Robinson, it is ordered by the Board, that each Commissioner appointed by the foregoing order, is hereby authorised to contract for, and purchase all such materials, provisions, labor, &c., as may be necessary to the completion of the surveys and reconnoissances respectively assigned to him.

On motion of Mr. Meredith, it is ordered by the Board, that the Chief Engineer shall be instructed to proceed without delay to organise the two field parties, already ordered by the Board; one of which he shall place on active service immediately, on the Salt River survey and reconnoissance—and the other to be immediately placed on service in making the survey, &c., of a route for a Rail Road from St. Louis to the Iron Mountain.

On motion of Mr. Robinson, it is ordered by the Board, that out of the Internal Improvement fund, the sum of *one thousand five hundred dollars* be entrusted to Hugh Meredith, the Commissioner appointed by this Board to superintend the survey and reconnoissance of Salt River. That the sum of *three thousand and five hundred dollars*, be entrusted to Benjamin F. Robinson, the Commissioner appointed to superintend the survey and reconnoissance of the Osage River.

That the sum of *two thousand five hundred dollars* be entrusted to Cornelius

Davy, the Commissioner appointed by this Board to superintend the survey and reconnoissance of the North Grand River.

That the sum of *three thousand dollars* be entrusted to Robert White, the Commissioner appointed by the Board to superintend the survey, &c., of the Merrimec River.

And that the sum of *five thousand dollars* be entrusted to George C. Sibley, the Commissioner appointed by this Board to superintend the survey and reconnoissance of a route for a Rail Road from the City of St. Louis to the Iron Mountain. Provided that the contingent expenses of the Board, (including the compensation of the Secretary of the Board, and the books and stationery necessary for his office,) shall be paid out of the funds entrusted to the said G. C. Sibley.

The Board then adjourned until 9 o'clock to-morrow morning.

Saturday, 11th May.

The Board met according to adjournment,

Present—All the Directors, except Mr. White.

On motion of Mr. Davy, it is ordered by the Board, that in order to obtain from the Treasury the Internal Improvement fund, there must be an order of this Board authorising the President thereof to make requisition from time to time, as may be specially ordered by the Board, on the Auditor of Public Accounts, in the form following.

"To the Auditor of Public Accounts for the State of Missouri.

SIR : You are hereby authorised and required to issue your warrant on the Treasurer of the State of Missouri, in favor of _____ for the sum of _____ to be paid out of money in the Treasury, appropriated by an act of the General Assembly of the State of Missouri, entitled "An act supplementary to an act, entitled an act to establish a General System of Internal Improvements in the State of Missouri," approved February 13th, 1839. The said payment to be made in conformity to law. By order of the Board of Internal Improvements."

And on motion of Mr. Davy, it is further ordered by the Board, in reference to the foregoing order, that the President issue his requisitions on the Auditor of Public Accounts in favor of each of the acting Commissioners of the Board, and in favor of the Chief Engineer; for the several sums of money assigned and entrusted to them respectively, for the purposes specified, by the two orders of the Board adopted on yesterday, on motions of Mr. Robinson.

And also, that the President issue his requisition on the Auditor of Public Accounts, quarterly, in favor of Wm. H. Morell, the Chief Engineer, for the amount of his quarter's salary, as the same falls due.

On motion of Mr. Meredith, it is ordered by the Board, that the office of the Chief Engineer shall be permanently located at the City of Jefferson.

On motion of Mr. Meredith, it is ordered by the Board, that every Director of the Board be authorised and required to devote such attention to each respective survey and reconnoissance ordered, as will satisfy him of the proper progress thereof.

On motion of Mr. Davy, the Board appointed Mr. B. F. Robinson to prepare By-Laws for the government of the Board, and those under its control.

Adjourned till Monday morning, 9 o'clock.

Monday morning, May 13th.

The Board met pursuant to adjournment.

Present—G. C. Sibley, President, C. Davy, H. Meredith, and B. F. Robinson.
Absent, R. White.

Mr. B. F. Robinson, who had been appointed on Saturday to prepare By-Laws, &c. made his report to the Board, which after discussion and some amendments was adopted, as follows:

1st. Until otherwise provided, the Board shall hold its two stated meetings in each year, as by law required, in the City of St. Louis, on the first Mondays of May and September.

2d. At all the meetings of the Board, the President shall take the chair at the time previously appointed, and on the motion of any member, the names of the absentees shall be noted on the minutes.

3d. The Secretary shall attend all meetings of the Board. He shall keep correct minutes of all its proceedings, and record the same, together with the names of the members present, and their places of residence, in a book to be called a journal.

4th. All motions and propositions offered to the Board, shall be submitted in writing by the mover, and the vote of each member upon any question, shall be *viva voce*, and entered on the minutes, if desired by any member of the Board.

5th. On motion of any member, the Board may at any time resolve itself into an interlocutory committee, and when any measure shall have been thus prepared, the President shall call to order, and the Board proceed thereon, in regular parliamentary method.

6th. It shall be the duty of the Secretary, to record in a well bound book, to be kept for that purpose, all the bonds and official oaths by law required to be so recorded. And after such bonds and oaths shall be recorded as aforesaid, the Secretary shall transmit the originals without delay, to the Secretary of State.

7th. The Secretary of the Board shall keep his office in the City of St. Louis, until otherwise directed. The journal of the proceedings of the Board, and all other books, &c., pertaining to said office, shall at all times be open to the inspection of the President and Directors, the Governor, Members of the General Assembly, and such other persons as they may designate—and to no others.

8th. The President shall examine and correct the minutes of the proceedings of the Board, and see that they be correctly and fully recorded in the journal in proper order and form, and he shall, from time to time, sign the same on the journal.

9th. In case a vacancy should occur in the office of Secretary of the Board, by death, resignation, removal from the county in which the meetings of the Board are held, or otherwise, the President shall appoint some suitable person to act as Secretary until the next meeting of the Board; who shall take charge of the office, books, papers, and all other appendages thereof, and receive for his services the same rates of compensation allowed the Secretary appointed by the Board.

10th. The President shall, without delay, certify officially to the Governor, all such orders and resolutions of the Board, as require his concurrent action therein. And the President shall generally do and perform all such duties as may be requisite to carry into effect the orders and resolutions of the Board.

11th. In order that the Board of Directors may be enabled promptly and fully to make their annual settlements with the Auditor, as the law directs; it shall be required rigidly, of all persons who may at any time be entrusted with any of the public money under the direction of the Board, to render their ac-

counts to the Board at their regular meetings on the first Mondays in May and September every year; which accounts shall exhibit full and correct statements, based upon sufficient vouchers, (in duplicate,) specifying, minutely, every expenditure, its object, use, &c. All which accounts and vouchers shall be filed in the office of the Secretary of the Board of Directors.

12th. The Chief Engineer shall take and subscribe an oath faithfully and impartially to discharge his duties: And he shall administer a like oath to his assistants and other persons employed under his authority, and certify the same to the Board.

Mr. Meredith being indisposed, asked and obtained leave of absence to return home in a boat ready to leave.

The Board then adjourned till to-morrow morning, 10 o'clock.

Tuesday, May 14th.

The Board met according to adjournment.

Present—G. C. Sibley, President, C. Davy, and B. F. Robinson. *Absent*—Mr. Meredith, on leave, and Mr. White, not yet arrived.

On motion of Mr. Robinson, it is ordered by the Board, that in case Robert White, (the Commissioner appointed by this Board to superintend the survey and reconnoissance of the Merrimac River,) shall not accept the appointment of Director of the Board of Internal Improvements, the person who may be appointed by the Governor in Mr. White's place, is hereby appointed and authorised to act as the Commissioner of the Board on the said survey and reconnoissance. And the President is hereby authorised and directed to issue his requisition on the Auditor of Public Accounts in favor of the person so appointed as aforesaid, for the sum of money, (*three thousand dollars*), heretofore appropriated by the Board for the survey and reconnoissance of the Merrimac river.

On motion of Mr. Robinson, it is ordered by the Board, that in order the better to enable the Chief Engineer to show the Geological and Mineralogical features of the River Osage, he is hereby authorised to call to his assistance some fit and proper person as Geologist, who shall receive a compensation not to exceed *five dollars* per day while in actual service; to be paid out of any money in the hands of the Commissioner appointed to superintend the survey and reconnoissance of said river.

At the request of Mr. Sibley, who could not concur with Messrs. Robinson and Davy in adopting the foregoing order, the following protestation was directed by the Board to be entered on the journal of their proceedings, to wit:

Believing that neither the appointment nor employment of a Geologist was contemplated or authorised by the Legislature, and that no money has by law been appropriated therefor, and for other reasons, G. C. Sibley dissents from, and protests against, the adoption of the order aforesaid, and requests that this declaration be entered upon the Journal.

On motion of Mr. Robinson, it is ordered by the Board, that the sum of *fourteen dollars* be allowed and paid to Timothy Leahy, out of the contingent fund, for his services to the Board, during the present session.

On motion of Mr. Davy, it is ordered by the Board, that a copy of the *rough minutes* of the proceedings of the Board to the present time, be prepared, signed by the President and each Director now present, countersigned by the Secretary of the Board, and immediately transmitted to the Governor.

On motion of Mr. Davy, the following resolution was unanimously adopted, to wit:

Resolved, That the President communicate to the Mayor and citizens of St.

Louis the thanks of the Board, for their kind services and polite attentions during their present session.

On motion of Mr. Robinson, ordered, that the Board now adjourn to meet again in the City of St. Louis, on the first Monday in September next, and the Board adjourned accordingly

GEORGE C. SIBLEY, *President.*

The Governor, "by and with the consent of the Board of Internal Improvements," appointed and commissioned.

WM. H. MORELL, to be Chief Engineer of the State of Missouri.

The Board of Directors made the following appointments.

GEORGE C. SIBLEY, President of the Board.

JOHN H. McMILLEN, Secretary.

CORNELIUS DAVY, Commissioner on the North Grand River survey, &c.

HUGH MEREDITH, Commissioner on the Salt River survey, &c.

B. F. ROBINSON, Commissioner on the Osage River survey, &c.

ROBERT WHITE, Commissioner on the Merrimac River survey, &c.

G. C. SIBLEY, Commissioner on the Rail Road route from St. Louis to the Iron Mountain.

At a stated meeting of the Board of Internal Improvements, begun and held at St. Louis, on Monday the 2nd day of September, 1839, the following named members appeared and took their seats:

Geo. C. Sibley, President.

Robert White and B. F. Robinson.

Absent—Hugh Meredith and Cornelius Davy.

On motion of Mr. Robinson, adjourned to meet to-morrow morning, at eleven o'clock.

Tuesday, September 3d.

The Board met pursuant to adjournment.

Present—Messrs. Sibley, White, and Robinson.

Absent—Messrs. Meredith and Davy.

Adjourned till 11 o'clock to-morrow morning.

Wednesday, September 4th.

The Board met according to adjournment.

Present—Messrs. Sibley, President;

White, Robinson, and Meredith.

Absent—Mr. Davy, who has not been heard from.

On Motion of Mr. Robinson, the following order was adopted unanimously, to wit: It shall be the duty of the Geologist who may be employed agreeably to the order of this Board, passed on the 14th day of May last, to select and deposite in the office of the Chief Engineer, all such specimens as he may deem useful in showing the mineral resources of the Osage River, and also,

to keep secret any valuable discovery or discoveries that he may make, till otherwise ordered by the Board.

On motion of Mr. Robinson, it was ordered, that the President of the Board shall have power to administer to all persons who are, or may be hereafter, employed under authority of this Board, such oath or oaths as may be necessary to the faithful discharge of duties required by law.

Adjourned till 9 o'clock to-morrow morning.

Thursday, September 5th.

The Board met agreeably to the last adjournment.

Present—Messrs. Sibley, White, Robinson, and Meredith.

Absent—Mr. Davy, not heard from.

Mr. Robinson offered the following resolution:

Resolved, That hereafter no epistolary communication shall be entered upon the records of the Board until the same shall have been submitted to the consideration of the members thereof in session, *Provided*, however, that any correspondence, as aforesaid, may be filed in the office of the Secretary of the Board.

On this resolution Mr. Sibley desired the yeas and nays.

Yeas—Messrs. Robinson, Meredith, and White.

Nay—Mr. Sibley.

So the Resolution was adopted.

On motion of Mr. Robinson, it is ordered,

That the President of the Board prepare as full and complete a statement of the accounts of the Board up to the 30th instant, as is practicable, showing the amount of moneys drawn from the treasury by the orders of the Board, in whose favor drawn, how much has been expended, by whom, and on what account, and report the same to the Auditor of Public Accounts.

Adjourned till to-morrow morning at 8 o'clock.

Friday, September 6th.

The Board met pursuant to adjournment.

Present—Mr. President, Messrs. White, Robinson, and Meredith.

Absent—Mr. Davy, not yet heard from.

The President laid before the Board a communication from the Chief Engineer, in the following words, to wit:

“ENGINEER’S OFFICE, St. Louis, Sept. 4th, 1839.

“TO G. C. SIBLEY, ESQ.

“*President of the Board of Internal Improvements,*

“SIR: I herewith submit for the information of the Board, a brief statement of the progress made in the duties assigned me by the Board at their meeting in May last.

“Two corps of engineers have been organized. One consisting of J. P. Cunningham, principal Assistant Engineer, at a salary of \$1250 per annum; Wm. R. Singleton, junior Assistant, at \$60 per month; B. H. Gordon, junior Assistant, at \$60 per month; Jo. W. Russell Rodman, at \$45 per month. This corps is at present engaged in the survey of a route for the Iron Mountain rail road.

“The other corps, consisting of Robert Walker, principal Assistant Engineer, at a salary of \$1250 per annum; L. H. Amsden, junior Assistant; H. S. Miles Rodman, at \$45 per month. This corps is now engaged in the survey of Salt River, and there is a cook in the service of each party, at \$30 per

month, and the other laboring hands, including the flagmen, are engaged at \$25 per month, for the first party, and \$20 for the second. For the transportation of the tents, &c., of the first party, a team and driver is employed. For the second a boat is used, and a boatman employed at \$30 per month.

The pay of Mr. Amsden I have left blank, and submit to the Board the following statement of the circumstances connected with his engagement, in the belief that they will find in them sufficient reasons to induce them to fix his salary at a higher rate of compensation than that fixed by their order of the 9th of May last.

"Immediately after my appointment, I addressed a note to Mr. Walker, and one to Mr. Amsden, tendering to each the situations of principal Assistant, at a salary of \$1250 per annum. Mr. Amsden was at that time engaged professionally in the State of Indiana. After waiting a reasonable time, and hearing from neither of the gentlemen written to, and the service being urgent, I secured the services of Mr. Cunningham, who was on the ground, and ready to commence immediately. Soon after, Mr. Walker arrived, and was received into service. Not knowing the locality exactly of Mr. Amsden, it was a long time before my letter reached him. Immediately upon its receipt, he resigned his situation, and hastened to join my corps. It will thus be seen that Mr. A. resigned his situation in Indiana, and entered the service of this State, under the expectation of receiving a salary of \$1250 per annum; while, by the order of the Board, I can only employ two assistants at that rate of compensation. It will also be perceived by the Board, that the corps under the direction of Mr. Cunningham, has one more assistant than originally contemplated; this the nature of the service rendered necessary, as Mr. Cunningham is compelled to be frequently in advance of his party, to make the necessary examinations, in order to select the ground upon which the instrumental surveys shall be made. This will be much less necessary in the survey of the rivers; and when the party enters on that service, he will be engaged in copying the surveys of this State in the office of the Surveyor General, who has kindly permitted the use of the records in his office for that purpose, in order to enable me to comply with that part of the internal improvement act which requires the chief engineer to make an accurate map of this State.

"This map has already been commenced, and the work will progress as opportunity shall permit. Under the order of the Board, of the 14th May last, I have appointed Dr. H. King as geologist, to assist in the survey of the Osage river. I have expended in the service the sum of \$427 17 in payments made to the gentlemen forming the corps of engineers, and which is properly chargeable to the general improvement fund, and not to any particular service; and I have to request the Board to take such order in the matter as will put me in possession of that amount.

(Signed.) "Respectfully, &c.
"WM. H. MORELL, Chief Engineer."

Which report of the Chief Engineer was accepted by the Board, and ordered to be entered on the journal of their proceedings and filed.

On motion of Mr. Robinson, it is

Ordered, That the sum of *one thousand dollars* be placed in the hands of G. C. Sibley (the President of the Board) as a fund to meet the contingent expenses of the Board; said Sibley first filing his bond with security as the law directs.

Mr. Robinson then offered the following resolution:

Resolved, That no money shall be paid out of the contingent fund, (*of one thousand dollars*;) except by the special order of the Board.

Mr. Sibley desired the yeas and nays.

YEAS—Messrs. Robinson, White and Meredith.

NAY—Mr. Sibley.

So the resolution was adopted.

The Board then took up the report of the Chief Engineer. In the case of Mr. L. H. Amsden, mentioned in said report, the following resolution was adopted unanimously:

Resolved, That it is not expedient to increase the pay of Mr. L. H. Amsden, as is solicited by the Chief Engineer.

On motion of Mr. White, it is

Ordered, That the sum of *four hundred and twenty-seven dollars and seven-teen cents* be paid to Wm. H. Morell out of the contingent fund.

On motion of Mr. White, it is

Ordered, That the sum of *one hundred and seven dollars and thirty-seven cents* be paid to John H. McMillan, in full of his account to this day for services, extra services, stationary, &c. And that *ten dollars and fifty cents* be paid to Timothy Leatry for services to the Board during the present session—which payments to be made out of the contingent fund of the Board.

And then the Board adjourned to meet in this place on the first Monday in May, 1840.

G. C. SIBLEY, *President*.

City of St. Louis, Sept. 6, 1839.

Monday, May 4th, 1840.

The stated meeting of the Board of Internal Improvements, appointed for this day, did not take place; only one member (G. C. Sibley) appearing.

Tuesday, May 5th.

Mr. B. F. Robinson, the member from Cole county, appeared to-day.

Wednesday, May 6th.

Messrs. Sibley and Robinson met this morning in conference; and having received positive information that neither of the other Directors would be in attendance at this appointed meeting, and that consequently there will be no quorum for the transaction of business, adjourned till the next stated time of meeting, the first Monday in September next.

G. C. SIBLEY, *President*.

City of St. Louis, May 6, 1840.

City of St. Louis, Monday, September 7th, 1840.

At a stated meeting of the Board of Internal Improvements, begun and held at St. Louis on this day, the following Directors appeared, to wit:

Cornelius Davy, of Jackson county.

B. F. Robinson, of Cole county.

Robert White, of Scott county.

The President (G. C. Sibley, of St. Charles county,) was in the city, but his attendance prevented by indisposition.

Hugh Meredith, of Marion county, absent from the State, and writes to the President that he does not expect to attend at this meeting of the Board.
Adjourned till 10 o'clock to-morrow morning.

Tuesday, Sept. 8th.

The Board met pursuant to adjournment.

Present—Messrs. Sibley, President, Davy, White and Robinson.

Absent—Mr. Meredith.

After calling the Board to order, the President stated that the principal business for the Board at this meeting is to prepare for their annual reports to the State Auditor and to the General Assembly. That a meeting of the Board will be necessary during the next session of the Legislature, and should be held at the seat of Government—that there are several claims and accounts against the Board to be examined and disposed of; and that some steps should be taken immediately to obtain from the Bank, at this place, a balance of about *thirteen hundred dollars*, yet due to the Board, of the *twenty thousand dollars* appropriated by the General Assembly for internal improvement purposes, and authorized to be obtained by the Governor on loan, and which the Governor supposed he *had* so obtained from the Bank; but which the Bank has not yet furnished by about *thirteen hundred dollars*. The President suggested that, in order the better to despatch business, (examine accounts, &c.) the Board should go into interlocutory committee:—whereupon,

On motion of Mr. Davy, the Board adopted, unanimously, the following resolutions, to wit:

Resolved, That the President be requested to address a note to the President of the Bank at St. Louis, enquiring whether the Bank will, or will not, furnish the residue of the sum appropriated by the General Assembly?

Resolved, That the Board will now go into interlocutory committee for the purpose of examining accounts and reports, and preparing for their reports to the Auditor of public accounts and to the General Assembly, &c.

The Board continued in committee during the day, taking a recess at noon; and adjourned till 9 o'clock to-morrow morning.

Wednesday, September 9th, 1840.

The Board met pursuant to adjournment.

Present—Messrs. Sibley, President, Davy, White and Robinson.

Absent—Mr. Meredith.

The President laid before the Board the report of the Chief Engineer, which was referred to interlocutory committee, and ordered to be filed with the Secretary.

The Board then went into committee and continued therein during the remainder of this day's sitting. At 4, P. M., adjourned till to-morrow morning at 9 o'clock.

Thursday, September 10th.

The Board met agreeably to adjournment.

Present—Messrs. Sibley, President, White, Robinson and Davy.

Absent—Mr. Meredith.

The President laid before the Board the following correspondence with the Bank, as per order of Tuesday last, to wit:

BOARD OF INTERNAL IMPROVEMENTS, }
 St. Louis, Sept. 8th, 1840. }

SIR:—The Board of Internal Improvements for the State of Missouri, now in session, desire to call the attention of the Bank of the State of Missouri to the circumstance of the detention, on the part of the Bank, of some *thirteen hundred dollars* of the twenty thousand borrowed by the Governor under the act of the General Assembly, approved February 13th, 1839, for internal improvement purposes, &c.

In the settlement of their accounts with the State, the Board have found it necessary to make requisition for the full amount of funds appropriated for their use by the Legislature; and feel it incumbent on them to obtain the balance still due upon the loan, if practicable, before they adjourn their present session: and to this end they now respectfully ask the Bank to take into consideration the subject as here presented; and communicate to them the result; to wit:—Whether the Bank will, or will not, place the above balance to the credit of the State Treasurer?

The Board beg leave to say, that they wish an immediate answer to this note, to enable them to take proper order on the subject in their report to the Legislature, now preparing.

Very respectfully,

(Signed,)

G. C. SIBLEY, *Pres't. B'd. Int. Imp'ts.*

To John Smith, Esq., President of the Bank of the State of Missouri, St. Louis.

ANSWER.

The Bank of the State of Missouri, }
 Saint Louis, Sept. 10, 1840. }

G. C. SIBLEY, Esq.,

President of the Board of Int. Imp'ts.

SIR: Your communication, dated 8th inst., was received by me yesterday morning. Our President, Mr. Smith, to whom the same was addressed, being absent, I have consulted as many of the Directors as I could, for the purpose of enabling me to afford you an answer.

I would premise that there must be some misapprehension on the part of your Board as regards the "*detention*," by the Bank, of a part of twenty thousand dollars designed by the Legislature for your use. It must be predicated upon the idea that the *Bank* became the *purchaser* of the *bonds* issued by the State. This is error—the Bank advanced the funds as upon an ordinary discount, deducting the interest from the principal borrowed; designing a reimbursement out of the bonds furnished, when the same should be sold. This has not yet been done.

I am authorized, however, with a view of accommodating your Board, to place to the credit of the Treasurer of the State, twelve hundred eighty-six dollars and seventy cents additional, which will make up the sum of twenty thousand dollars afforded by the Bank for "the Board of Internal Improvements;" which sum is this day placed to his credit, and he and the Auditor of public accounts duly advised thereof.

I am, very respectfully, &c.,

(Signed,)

H. SHURLDS, *Cashier.*

The Board passed, unanimously, the following order, on motion of Mr. Davy:

Ordered, by the Board, That the Chief Engineer is hereby required to keep in the employ of the State, only such assistant engineers and draughtsmen as he may actually need, to complete proper maps of the different surveys finished and in progress, as also a map of this State; so that all may be completed about the commencement of the approaching session of the Legislature;—and that all persons so engaged shall prosecute their respective duties at the city of Jefferson, unless sent by the Chief Engineer elsewhere to obtain some necessary information.

On motion of Mr. Robinson, it is

Ordered, That the President of the Board prepare as full and complete a statement of the accounts of the Board, up to the 30th inst., as may be practicable, and forward the same to the Auditor of public accounts.

Ordered, also, That it shall be the duty of each Commissioner of the Board, and of the Chief Engineer, to file with the Secretary of the Board, without delay, such statements in relation to their respective accounts with the Board as may be necessary, to enable the President properly to comply with the above order.

The Board spent some time in committee, and then at half past 4, P. M., adjourned till 9 o'clock to-morrow morning.

Friday, September 11th, 1840.

The Board met according to adjournment.

Present—G. C. Sibley, President, C. Davy, R. White and B. F. Robinson.

Absent—Hugh Meredith.

Messrs. Robinson, Davy, White and Sibley filed their respective statements, as required by the order passed yesterday.

The President stated that he had received from Mr. Meredith, and duly filed, sundry papers in relation to his accounts, from which he can obtain the requisite information, &c.; and that the Chief Engineer's reports, now on file, will afford the needful information as to *his* account.

On motion, the Board resolved, as follows:

Resolved, unanimously, That when the present session of the Board adjourns, it shall adjourn to meet in the city of Jefferson, on the first Monday (the 7th day) of December next; and that, until otherwise ordered, all future meetings of the Board of Internal Improvements shall be held in said city of Jefferson; and the President is hereby required to take possession of all the books, records, files and papers of the Board, and cause the same to be safely conveyed to the city of Jefferson, and deposited in the office of the Chief Engineer, in charge of the Chief Engineer, subject to the further order of the President or Board.

On motion of Mr. Davy, unanimously

Ordered, That each Commissioner of the Board shall be allowed three dollars per day as compensation for services actually rendered.

Mr. Davy, as from interlocutory committee, reported to the Board that no final settlement could conveniently be made at this time with either of the Commissioners of the Board, or Chief Engineer; nor was it necessary now to require such settlements—that the committee has examined sundry claims and accounts presented against the Board, amounting in the whole (as allowed by the committee) to the sum of \$15,448 15, besides sundry others not allowed, or suspended for further explanation—that the funds now available to the Board to meet these claims, amount to no more than \$954 96. In view of this state of things, Mr. Davy offered the following for consideration, to wit:

WHEREAS, it appears that there are several outstanding claims against the Board, not properly cognizable by either of the Commissioners of the Board; and that there is an unexpended balance of \$454 96 of the contingent fund of the Board in the President's hands; and also, in the State Treasury, at the disposal of the Board, a balance of \$500;—it is, therefore, hereby

Ordered, by the Board, That the President, G. C. Sibley, is hereby authorized and directed to draw from the Treasury the aforesaid balance of \$500, (giving his bond in the form prescribed, &c.) which sum of \$500, together with the aforesaid balance of the contingent fund, (\$454 99) the President is hereby required to use towards the payment of the following claims, to wit:

1. John H. McMillan,	-	-	-	\$150 00
2. Jos. Wm. Russell,	-	-	-	152 50
3. John P. Cunningham,	-	-	-	427 80
4. Wm. R. Singleton,	-	-	-	299 12

AND, WHEREAS, the following sums appear also to be due to the persons named, viz: Peter Lindall, assignee for a balance due Robert

Walker,	-	-	-	\$111 08
2. S. W. Meech, stationery, &c.,	-	-	-	248 58
3. J. C. Dinnies & Co., do.	-	-	-	61 86
4. Joseph Foster for camp and office furniture,	-	-	-	93 21

And it is hereby also

Ordered, by the Board, That should there remain any balance in the hands of G. C. Sibley, Commissioner on the Rail Road Survey, after paying the whole expense of that survey, contingencies of the Board, &c., he is hereby authorized and required to use the same, as far as it will go, towards the payment of the claims last named herein.

All which report and orders were unanimously agreed to and adopted, by Messrs. Davy, White and Sibley—Mr. Robinson not present, having previously obtained leave of absence, and left the city homeward.

On motion of Mr. White, the Board now adjourned, to meet at the city of Jefferson on Monday, the 7th day of December next.

G. C. SIBLEY, *President.*

City of St. Louis, Sept. 11, 1840.

CITY OF JEFFERSON, *Wednesday Dec. 9th, 1840.*

As in conformity with the last adjournment of the Board (11th Sept.) the following named Directors appeared here this morning to wit:

Geo. C. Sibley of St. Charles county, President.

Hugh Merideth of Marion county.

Absent—Messrs. Cornelius Davy of Jackson, B. F. Robinson of Cole, R. White of Scott, resigned, there being no quorum present adjourned till 9 o'clock, to-morrow morning.

Thursday, Dec. 10th.

The Board met pursuant to adjournment.

Present—Messrs. Sibley, Merideth and Robinson.

Absent—Mr. Davy, not arrived or heard from.

Mr. Sibley stated that his attendance sooner than yesterday morning was prevented by the death of a relative in his family.

Mr. Merideth and Mr. Robinson were also unavoidably detained, as they informed the Board. Mr. Merideth who was absent from the two last meetings of the Board stated the reasons for his absence, which were by the Board considered good and satisfactory.

The President called the attention of the Board to the principal object of present meeting, namely, to make up a Report to the General Assembly, now in session, in compliance with the 13th section of the 1st article of the Internal Improvement act.—

And on motion, It is

Ordered—By the board; that the Board will now proceed as in *interlocutory committee*, to collect and arrange the necessary materials for a full and complete Report, to be laid before the General Assembly as soon as it can possibly be properly prepared.

That the Board will assemble every morning at 9 o'clock. (Sundays excepted,) for the dispatch of business, until all shall be completed. Adjourned.

Friday, December 11th, 1840.

The Board met this morning at 9 o'clock.

Present—Messrs. Sibley, Merideth and Robinson.

Absent—Mr. Davy not yet heard from.

Mr. Sibley presented his Report as the commissioner of the Board on the survey of the Rail Road Route from St. Louis to the Iron Mountain, which was ordered to be entered at large on the Journal, as follows:

"To the Board of Internal Improvements.

"In conformity with the order of the Board passed on the 10th of May, 1839 appointing me their commissioner to superintend the reconnoissance and survey of a route for a Rail Road from the City of St. Louis to the Iron Mountain; I entered immediately on the duties assigned me, and in conjunction with the Chief Engineer caused the survey to be commenced as soon as the necessary preparations could be completed; which were made principally under the immediate direction of Major Morell, in whose professional experience I entirely confided to appoint and equip the party employed in that service.

"We found at the outset that the number of assistants specified in the order of the Board of the 9th May, 1839, was insufficient to ensure the most expeditious and economical execution of the survey; and also that it was impracticable to hire any suitable common hands at the rate of wages fixed on by the Board.

"We therefore employed an additional assistant, and were compelled to pay from twenty-five to thirty dollars per month for labouring hands. We were able however to reduce the monthly wages of the Flagman, by causing a common hand to perform the duty.

"The survey was commenced at the shore of the Mississippi river in the city of St. Louis, on the 9th day of June, and was completed at the summit of the Iron Mountain in the county of St. Francois on the 30th day of October 1839.

"I then immediately as soon as the bad weather permitted, caused the party with the whole equipment to be transported across the country to Massey's Iron works where they were directed to commence the survey of the Merrimec river; there I paid them all off in full to the 8th November inclusive, and transferred them with *all* the public property attached to Robert White Esq., the commissioner of the Board under whose superintendence the survey of the Merrimec river was to be conducted.

"As the Board will look to the Chief Engineer, and not to me for a detailed Report on this survey, I shall only offer here, a few remarks, in addition to what

it is to my particular province to state in relation to the expense incurred in its accomplishment.

"From some notes of this survey in my possession, furnished me by Major Morell, it appears that the length of the line as surveyed is 115½ miles that it passes through the heart of the mineral region, and also through extensive coal fields and Pine forests.—That the greatest elevation above the general level to be overcome by propelling power; in the whole about 12 miles, is seventy feet to the mile; consequently requiring engines of the highest class, and a construction heavy and expensive in proportion—That the establishment of a Rail Road thereon, *complete* with all the necessary engines, cars, coaches, shops, &c., will require an expenditure of about *three millions of dollars*; and that an annual revenue of nearly *half a million of dollars* will be requisite to yield a clear income of six per cent. on the capital invested.

"The survey has doubtless been accurately and faithfully executed, and may be confidently relied on as the basis of any future prosecution of the contemplated improvement.

"It ascertains a practicable route for a Rail Road between the two points, in the direction designated by the Legislature, and although it may not now be expedient either for the State or a company to undertake the work; the time will probably soon arrive when the incalculable and exhaustible mineral riches of the region through which our survey passes, not to mention the mountain of iron ore at its terminus, shall be more fully developed by individual enterprise; will demand even more costly facilities, if necessary for their diffusion.

"Meanwhile the State will possess all the facts, estimates, &c., resulting from this survey; which will be sufficient *data* for any future legislation on the subject.

"The cost of this survey altho' considerably within the estimate and appropriation, was unavoidably increased, not only by the higher rate of wages paid for laboring hands, but also by detentions consequent on sickness in the party, produced by their exposure during the extreme heat of summer, in the dense thickets and flinty hills, among which the line of the survey was obliged to pass—and I may add with truth and propriety, that it was also increased by the extortionate charges of many of those from whom the necessary subsistence and other supplies for the party were obliged to be purchased along the route.

"The Board will perceive that the party engaged in this service, was in the field, five months, including the few days occupied in their transfer to the Merrimac—The principal assistant, engineer and the rodman, were in service and under pay *six months*, being employed the first month, principally, in preparing the outfit for the Rail Road and other surveys; for which service, they were wholly paid out of the Rail Road appropriation in my hands.

"Including this last named expenditure, amounting to \$169 42-100, the Rail Road reconnoissance and survey, has cost the sum of *three thousand seven hundred and one dollars and thirty-one cents*; (\$3701 31-100,) which the Board will find exhibited in ample detail, in the statement and accompanying vouchers herewith presented. All which with this report, are respectfully submitted.

G. C. SIBLEY,

City of Jefferson, Dec. 11th, 1840.

Mr. Merideth also laid before the Board his final Report on the Salt river survey, which was ordered to be recorded in the Journal and is in the following words to wit:

"Report of Hugh Meredith commissioner for the survey of Salt river made to the Board of Directors of Internal Improvements for the State of Missouri Dec. 11th, 1840.

"Having been appointed by the Board of Directors of Int. Improvements at a meeting in May 1839 commissioner for the survey and reconnoissance of Salt river, and having concluded the duties of that appointment, I respectfully present my report accompanied by an account of the disbursements and the sustaining vouchers.—

"The survey was commenced August 30th and completed December 1st, 1839—the results will appear in the Report of the State Engineer, to which I refer for all details and estimates—A chart of the survey has been completed and may be seen in the office of the Engineer.—The amount of disbursements authenticated by vouchers as is shown in the account, has been \$1614 78—showing a balance in my favor of \$114 78-100, my own account against the State is \$252 44-100 as shown per voucher No. 43, of this amount \$153 arises from attendance on the Board, and an examination of the Rail Road route, leaving \$99 44 for services and expenditures on Salt river survey—sixteen dollars eighty-two cents (\$16 82) cts. is also justly chargeable to the contingent fund having been expended not especially for the Salt River survey, but for the general service. This amount of \$16 82 added to the \$153 above mentioned makes a sum of \$169 82 which should be deducted from the whole amount paid by me viz: \$1614 78, leaving a balance of \$1444 96, the true amount paid by me as commissioner on Salt River survey.

"From the account now presented it appears there is still a balance of \$36 due L. H. Amsden for services rendered as surveyor on this survey, which will shew the whole cost of the survey to have been \$1480 96-100.

"Some of the vouchers it will be seen were taken in the names of W. H. Morell and L. H. Amsden, who acted at times, as agents for me during my absence from the party, occasioned by the sickness of my family; motives of economy for the interests of the State also induced me occasionally to disburse through these gentlemen, as by this means my constant attendance was rendered unnecessary.—The expenditures upon this survey have been much increased by delay in procuring the levelling instrument from Baltimore; in consequence of which it became necessary to traverse the whole line twice. The survey has however been completed in a satisfactory manner, and the respective duties of the gentlemen employed have been fulfilled with much attention, industry and ability.

"There is one subject alluded to in the report of the Engineer which I respectfully point out to your particular attention. Salt River has been recognised as a navigable stream, both by the General Government and by an act of the Legislature of Missouri; this recognition has induced a preference with many persons to purchase in the section of country fertilized by the waters of this stream; they justly consider that its navigation is a right secured to them under the sacred enactment of the State, which if not further improved by slack water, or otherwise, should at least be preserved in its natural and unobstructed condition, this right has been violated in several instances by the construction of dams across the stream, without locks or other means of passage for boats. If such individuals as have erected dams, or who may hereafter erect them, were obliged to construct suitable locks upon such regular and systematic plan as might be furnished by the Engineer, this right would be reserved inviolate. The water could be employed for manufacturing purposes, and in the course of time the whole length of the stream would be improved into a slack water navigation.

"The first duty of the Board, under the act by which it has been organized, is 'to ascertain the most proper objects of improvement in relation to *roads* and navigable waters, and report thereon to every General Assembly.' In accordance with this instruction, I will suggest to the Board an object in which a large portion of Northern Missouri is deeply interested, and especially that portion in which reside my more immediate constituents, viz: A road from *Hannibal*, on the Mississippi, by the most direct route to *Brunswick*, on the Missouri river, surveyed and laid out by a competent engineer, with a view to its gradual improvement by McAdamizing or otherwise, as the wisdom of future Legislatures may direct. This road is required at the present time, and the urgency of the demand rapidly increases. Surveyed and laid out in this way, and with this view, it would become at once the great highway of the interior country to the river markets; the care and attention of the people would be bestowed upon it; the counties immediately interested would make appropriations for its improvement; the hills would be cut and sloped; the low spots embanked and elevated, and the streams bridged—all with little or no other cost to the State Treasury than that of the first survey; and at some, not distant, day, when the mighty resources of our fertile soil shall have been further developed by private enterprise, fostered by such prudent steps as the one above recommended, and the wealth of the country will justify the measure, a direct route, graded and rendered solid from use, will have been prepared for such other improvement as the country may then require and the Legislature authorize.

"I close my report with the request that this object of improvement be recommended by the Board to the General Assembly as one worthy immediate attention.

(Signed,)

"H. MEREDITH."

The following is the report presented to the Board by Robert White, Esq., late Commissioner of the Board to superintend the survey of the *Merrimec River*.

Ordered to be entered at length upon the journal, viz:

"*To the Board of Internal Improvements:*

"Robert White, appointed by the Board by order of 10th of May, A. D., 1839, to superintend the reconnoissance and survey of the *Merrimec River*, as Commissioner, submits the following report of his labors to the Board:

"Previous to entering definitely upon the duties assigned me by the order of the Board, I spent a portion of my time in assisting at the reconnoissance of the survey of the *Salt River*, and also that of the rail road route from the city of St. Louis to the Iron mountain in St. Francois county. However, I entered upon the discharge of the duties assigned me by order of the Board aforesaid, on the 15th day of October, A. D., 1839. My attention was first turned to the construction of boats and crafts, and making other necessary preparations for the survey of said river, the reconnoitering party not being present; but said party joined me on the 8th day of November, A. D., 1839, and we immediately proceeded from the head of *Big Spring*, at Massey's Iron Works, in the prosecution of the contemplated work.

"The party consisted of Principal Assistant Engineer, Surveyor, Rodman, and laboring hands. We continued in the prosecution of our labor until 30th day of November, in the year A. D., 1839, when the weather growing cold and inclement, and by order of the Chief Engineer, we repaired to Jefferson city, at which time most of the laboring hands were discharged, the young gentlemen forming a part of the party being retained in the Chief Engineer's office.

On the first day of April, in the year 1840, I again repaired to the city of Jefferson, equipped again, and proceeded to continue the survey of the Merrimec whence we left off. However, before we recommenced our labors on our arrival at the Merrimec River, we were detained some two or three weeks in procuring laboring hands, some of those whom we had previously engaged having left us about the time of our commencing business. We then recommenced our survey, and unremittingly continued our labors until the 30th day of August, A. D., 1840, having completed the survey, with the exception of thirty miles of levelling, which has since been completed.

"In August, when we discontinued our labors, we were compelled to do so in consequence of the illness of some of our party. In truth, we were detained at least two weeks during the time engaged in the survey and reconnoissance of the Merrimec, previous to August, in consequence of the indisposition of some of the party, and in consequence of a small accident which happened one of our boats, which occasioned the loss of one of our most important instruments; which, however, was finally recovered.

"I respectfully refer the Board to the report of the Chief Engineer, for a more detailed and satisfactory report of the survey of the Merrimec. The whole amount expended by me on said survey, is *three thousand and one dollars and five cents*, which is evidenced by the accompanying exhibit and vouchers marked A. and made a part of this report. There is yet due and owing several persons, as follows:

To W. R. Singleton as P. S. Engineer,	-	-	\$46 00
" Mr. Page as Rodman,	-	-	68 75
" Joe (black boy) as hand,	-	-	105 33
" T. M. Anderson as Rodman,	-	-	33 00
			<hr/>
			\$253 08

Deduct (per voucher 11) this sum not properly chargeable to this survey,	-	-	-	45 50
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				<hr/>	\$207 55
Add expended,	-	-	-	-	3001 05

Cost of Merrimec survey,	-	-		\$3208 63
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(Signed,)

"ROBT. WHITE."

December 11, 1840.

The Board adjourned.

Saturday, December 12th, 1840.

The Board met this morning at 9 o'clock.

Present—Messrs. Sibley, Robinson and Meredith.

Absent—Mr. C. Davy—not yet heard from.

Mr. B. F. Robinson, Commissioner on the Osage River Survey, filed his final report thereon, which is ordered to be placed on the journal; and is in the words following, to wit:

"To the Board of Internal Improvements:

"In addition to the foregoing account current, I take the liberty of subjoining—That the expenses of the Osage survey and reconnoissance were necessarily increased in consequence of a delay of the party occasioned by high water, and also by reason of the remote situation of *Osceola*, the point of commencement from navigation; the transportation of stores, &c., to that point amount-

ing to *two hundred dollars*, being more than their original cost. In addition to this, I will state that the disbursements made by me by an order of the Board of May, 1839, (see journal, p. 25) for a geological examination of the valley and contiguous regions of the river Osage, amounting to about *eight hundred dollars*, likewise increased the expenditures on the survey of that river; and the amount paid out for that examination, I presume, is more than was anticipated by the Board at the time the order passed their body.

"By an examination of my account, it will be seen that there has been expended by me on the survey of the Osage river, the sum of *two thousand nine hundred and five dollars and fifty-five cents*, including the geological examination, and exclusive of my account for services per diem, &c., as will be seen by voucher No. 50. The balance due for that survey is \$313 78—as follows: to B. Gordon \$65 16; T. Anderson \$142; Mr. Overshaw \$51 87; and to Edward David \$54 35. Besides the balance due me, as per account, to meet these demands, there is in my hands accounts and notes to the amount of *ninety-six dollars and twenty-five cents*.

"I cannot conclude without adverting to the peculiar inconveniences under which a large and respectable population of Missouri labor in consequence of their remoteness from navigation.

"Salt, sugar, coffee, and many of the necessities of life, cost them *double and thrice* at what they can be purchased at or near our navigable rivers; and this, too, it should be recollected, although they have flowing through their very midst a magnificent stream, one that could be made navigable two hundred and fifty miles at a cost of about *two hundred thousand dollars*. Economy, as much as I admire it, here loses its charms, and indeed becomes wasteful extravagance. Extreme parsimony not unfrequently occasions poverty to individuals; and may not too rigid an economy impoverish a State or a nation, by retarding its developments, and cramping the industry and enterprise of the people?

Very respectfully,

(Signed,)

"B. F. ROBINSON,

"Commissioner of Osage Reconnaissance and Survey."

The Board adjourned till Monday.

Monday, December 14th, 1840.

Present this morning—Messrs. Sibley, President, Meredith and Robinson.

Absent—Mr. Davy—and not yet heard from.

Mr. Sibley laid before the Board statements of all his accounts, as Commissioner and Agent of the Board, accompanied by *forty-five* vouchers, in duplicate, and asked the Board to examine and pass upon them.

Messrs. Meredith and Robinson thereupon entered upon that duty as in committee; and

The Board adjourned till to-morrow at 9 o'clock.

Tuesday, December 15th, 1840.

Present—Messrs. Sibley, President, Robinson, and Meredith.

Absent—Mr. Davy—not yet heard from.

Mr. Meredith's accounts were by him laid before the Board this morning, with his vouchers, (No. 1 to 43) in duplicate, and Messrs. Robinson and Sibley directed to examine them and report thereon.

Adjourned.

Wednesday, December 16th.

Present—Messrs. Sibley, Robinson and Meredith.

Absent—Mr. C. Davy—and not yet heard from.

Mr. B. F. Robinson's accounts and vouchers were, at his request, taken up, and referred to Messrs. Meredith and Sibley to examine and report thereon.

Adjourned.

Thursday, December 17th.

Board met at the office of the Chief Engineer.

Present—Messrs. President, Meredith, and Robinson.

Absent—Mr. C. Davy—not heard from yet.

Mr. Robert White, late Commissioner of the Board on the Merrimac River Survey, presented all his accounts and vouchers, in duplicate, to the Board this morning; which were referred for examination to Messrs. Robinson and Meredith.

Major Morell, Chief Engineer, also presented *his* accounts, vouchers, &c., for examination and adjustment; which were referred to Messrs. Robinson and Sibley, &c.

AFTERNOON—Messrs. Meredith and Robinson report on the accounts of Geo. C. Sibley, that they have examined and find them all correct—that he received at different times, by orders of the Board, for disbursement as their Commissioner and Agent, the sum of *six thousand and five hundred dollars*—that he has filed vouchers, (*forty-five* in number) showing an aggregate just charge against the Board and the State of *six thousand seven hundred and eight dollars and eighty-one cents*; and that there is due him thereon, *two hundred and eight dollars and eighty-one cents*. That his charge for personal services and contingent expenses, is \$657 23 altogether, since the 1st May, 1839, to wit:

As Commissioner on the Rail Road Survey,	-	-	\$198 00
Postages and stationery,	-	-	2 05
			<hr/>
See voucher No. 9 on file,	-	-	\$200 05
As President and Director of the Board,		\$447 00	
Postages, Stationery, &c.,	-	10 68	
			<hr/>
See voucher No. 45 on file,	-	-	\$457 68
			<hr/>
Six hundred fifty-seven dollars and seventy-three cents,			\$657 73

On Mr. Meredith's accounts, Messrs. Sibley and Robinson report that they have examined and find them all correct as stated by him—that he received from the Board \$1500 for disbursement as Commissioner on Salt River Survey. That he has filed vouchers proving an aggregate expenditure of \$1614 78, (including \$252 44 for his personal services,) and that there is now due him from the State, *one hundred and fourteen dollars and seventy-eight cents*.

On the accounts of Mr. Robinson, Messrs. Meredith and Sibley report that they have duly examined them with the vouchers filed, and are satisfied that his statement of receipts and disbursements is correct. There is evidence of an aggregate expenditure on the Osage River Survey of \$2905 55; to which add Mr. R.'s charge for his personal services, (\$603) and some other contingencies noted in the same voucher, No. 50, amounting to \$33 02, will in all make the sum of \$3541 57. Mr. Robinson received from the Board \$3500 in State

funds, and also \$18 on account of a horse sold, and acknowledges notes and accounts in his hands due the State and Board, amounting to \$96 25, \$3614 25
 Amount disbursed per vouchers, - - - - 3541 57

Leaves this balance due by Mr. R. which he holds in unsettled notes, &c., - - - - 72 68

Messrs. Robinson and Meredith report as follows upon Mr. R. White's accounts: That they have examined them carefully, with the vouchers filed, and believe them to be correctly stated. The *forty-five* vouchers exhibited show an aggregate disbursement by Mr. W. of \$3001 05. He received from the Board \$300—consequently there is now due him *one dollar and five cents* from the State. Mr. White charges—

For his services as Commissioner,	-	-	\$357 00
For his services as a Director,	-	-	244 75
For his contingent expenses,	-	-	32 00

\$633 75

Which charges are embraced in his account of disbursements per his vouchers Nos. 42, 43, 44.

Messrs. Robinson and Sibley, to whom was referred for examination the disbursement account of Wm. H. Morell, report thereon as follows;

That the sum of *one thousand dollars* was placed in Major Morell's hands by order of the Board of May 10th, 1839, (see p. 20) for which his bond is on file in the Secretary of State's office; and that the further sum of *four hundred and twenty-seven dollars and seventeen cents* was paid him by order of the Board passed September 6th, 1839, (see pp. 34 and 39) making altogether the sum of \$1427 17—which is the whole amount that is chargeable against him on this account. Major Morell has produced satisfactory evidence, contained in *forty-six* vouchers filed with his account, that he has disbursed in the service the sum of *sixteen hundred and fifty-one dollars and five cents*, and that there is now due him from the State, on this account, the sum of *two hundred and twenty-three dollars and eighty-eight cents*.

On motion of Mr. Meredith, it is hereby

Ordered, by the Board, That the President draw upon Cornelius Davy, Commissioner of Grand River, for the sum of *two hundred and eight dollars and eighty-one cents* in favor of Geo. C. Sibley—also for *one hundred and fourteen dollars and seventy-eight cents* in favor of H. Meredith; and also for the sum of *five hundred and forty-one dollars and twenty-seven cents* in favor of Major Wm. H. Morell—all to be paid out of the balance remaining in his hands, as per his account filed in the Auditor's office.

The following order was adopted by the Board, on Mr. Meredith's motion, to wit:

WHEREAS, it appears from Mr. B. F. Robinson's accounts, on file, that he holds certain notes and claims amounting to \$96 25, which are the property of the State at the disposal of this Board:—it is hereby

Ordered, That the collection of said dues shall be confided to Mr. Robinson; and out of the proceeds thereof he shall discharge the balance that appears due him on his disbursement account, (\$23 57) and the residue (\$72 68) he is hereby authorized and directed to pay into the hands of such Commissioner or Agent as this Board may appoint to receive and disburse the same.

On motion of Mr. Meredith, it is hereby

Ordered, That the sum of *two hundred and eight dollars and eighty one cents* be allowed to Geo. C. Sibley, being the balance due him on his account rendered and filed; and that the sum of *one hundred and fourteen dollars and seventy-eight cents* be allowed to Hugh Meredith for a balance due to him upon his accounts rendered and on file—which sums to be paid out of moneys in the hands of Cornelius Davy, Commissioner on the North Grand River Survey;—and that the balance of the funds then remaining in Mr. Davy's hands (\$541 27) shall be placed in the hands of Wm. H. Morell, Chief Engineer, to be by him accounted for;—*Provided*, that the balance due to Robert White (\$1 05) and the balance due to Wm. H. Morell on his disbursement account (\$223 88) shall be paid out of the said fund, and the residue to said Morell towards his quarter's salary.

On motion of Mr. Meredith, it is hereby

Ordered, That the President is required to notify Cornelius Davy of the foregoing orders; (relating to the funds in his hands,) and also that he is required to file his final accounts as Commissioner of the Board, accompanied by vouchers, in the office of the Board of Directors, and also in the office of the State Auditor, with the least possible delay.

On motion of Mr. Meredith, it is hereby

Ordered, That the President of the Board, Geo. C. Sibley, is hereby appointed Commissioner and Agent of this Board, to receive whatever moneys may be due the Board from any source; and also to receive any money that may be hereafter appropriated by the General Assembly, now in session, for the use of the Board of Internal Improvements; (said Sibley executing sufficient bond as by law required,) and to disburse the same promptly in the payment of all accounts allowed by the Board, together with such as may arise from the completing the business in the Chief Engineer's office; and account for the same to the proper office, without any unnecessary delay.

On Mr. Robinson's motion, it is

Ordered, by the Board, That the examiners of the accounts of the several Commissioners and Chief Engineer, be authorized and required to affix suitable certificates thereto; and that one set of each, with the vouchers pertaining thereunto respectively, shall be filed in the office of the Board; and the other set be filed in the office of the State Auditor; and that those filed in the office of the Board shall be held subject to any call of the General Assembly.

Mr. Meredith offered the following, which was adopted, to wit:

It is ordered by the Board, that Geo. C. Sibley and B. F. Robinson be a committee to copy and correct the rough draft of the report of this Board to the General Assembly, which they are hereby required to communicate to that body as soon as the appropriate documents can be prepared and copied that are referred to in said report; and also that said committee shall exercise a general superintendence over the records and files of the Board, and the public property at the disposal of the Board; and the same dispose of in such manner as may, in their opinion, be most for the public interest.

At the suggestion of the President, the Board requested the Chief Engineer to furnish, forthwith, an accurate list of all outstanding claims against the Board in his department; giving the true amount of each up to the 15th inst., including his own salary due; and also an estimate of the probable expense to be further incurred in completing the maps of the five surveys finished, and of the State map, as far as it can be now finished; and that said Chief Engineer be required to furnish an inventory of all the instruments, office and field furniture, and other public property, in his charge or possession.

And in conformity with this order, the Chief Engineer immediately handed

in lists, of which the following are copies, directed by the Board to be inserted in the journal, to wit:

Due to L. H. Amsden, services,	-	-	-	\$541 06
" B. Gordon, do.	-	-	-	423 16
" J. W. Russell, do.	-	-	-	168 75
" T. M. Anderson, do.	-	-	-	257 88
" W. R. Singleton, do.	-	-	-	252 00
" Wm. H. Morell, do.	-	-	-	889 17
" S. W. Meech, for stationery, &c.,	-	-	-	248 58
" J. C. Dinnies & Co., do.	-	-	-	61 86
" J. P. Cunningham, services,	-	-	-	143 80
" Joseph Foster, camp furniture,	-	-	-	85 21
" J. T. Stibbs, repairing tents,	-	-	-	18 00
" Sublette & Campbell, blankets,	-	-	-	42 00
" John Wells, office rent,	-	-	-	120 00
" C. Gunn, printing circulars,	-	-	-	7 50
" Post Office, city of Jefferson,	-	-	-	8 44
" Hill & Rasin, for candles,	-	-	-	32 00
" J. Paulsal, for wood,	-	-	-	30 00
" Servant and wood chopper,	-	-	-	30 00
" For sheet Iron fenders,	-	-	-	3 00
" For copies of surveys,	-	-	-	5 00
" Mr. Blattner, repairing instruments,	-	-	-	24 00

Total due,	-	-	-	-	\$3391 41
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Estimate to 15th February, to wit:

Amsden, 2 months' service,	-	-	-	\$208 33
Gordon, do. do.	-	-	-	120 00
Singleton, do. do.	-	-	-	120 00
Russell, do. do.	-	-	-	90 00
Anderson, do. do.	-	-	-	90 00
Morell, Chief Eng'r., do.	-	-	-	333 33
Servant and wood cutter,	-	-	-	40 00
Fire Wood,	-	-	-	60 00
Candles,	-	-	-	18 00
Office rent and repairs,	-	-	-	40 00
Stationery, &c.,	-	-	-	30 00
Cloth and roller for map,	-	-	-	10 00
				<hr/> \$1159 66

Amount now due, and estimate to the 15th February—in all, \$4551 07

Inventory of articles belonging to the State of Missouri, and connected with the Engineering Department.

OFFICE FURNITURE—5 walnut tables, 2 do. wash stands, 4 pine drawing boards, 3 mahogany rulers, 1 walnut ruler, 12 mahogany triangles, 4 tin cylinders, 2 pair tongs, 1 shovel, 9 candlesticks, 2 wash pans, 1 wash bowl, 1 pitcher, 1 vol. Public Works of Great Britain, vols. 1 and 2 Transactions of the Institution of Civil Engineers.

INSTRUMENTS—2 levels and tripods, 2 compasses and Jacob staves, 2 rods and

targets, 1 beam compass, 1 protractor, 2 slope instruments, 1 pocket compass, 1 magnifying glass, 2 tape measures, 2,50 ft. chains and pins, 1 small boat anchor, 3 axes, 1 do., 6 hatchets, 5 hatchet belts, 2 brush knives, 1 drawing knife, 1 auger, 1 box small instruments.

CAMP EQUIPAGE.—4 wall tents and 3 flies, 1 cook's tent, two large mess chests, 2 small do., 10 camp stools, 9 mattresses, 9 pillows, 24 pairs blankets, 4 large tin buckets, 2 small do., 2 tea kettles, 2 large pots, 1 small do., 4 ovens and lids, 4 gridirons, 4 tin boilers, 2 stew pans, 3 frying pans, 1 sheet iron do., 9 tin pans, 4 tin coffee pots, 2 tin tea pots, 6 tin cups, 3 tin dippers, 3 coffee mills, 1 skimmer, 1 flesh fork, 2 sieves, 1 pair shovel and tongs, 2 sheet iron fenders, 1 spider, 21 dining plates, 7 dishes, 2 pitchers, 2 sugar bowls, 21 tea cups and 18 saucers, 17 soup spoons, 19 tea do., 1 large iron do., 1 bowl, 12 Britannia tumblers, 1 set castors, 20 knives and 15 forks, 2 carvers and forks, 2 steels and 1 salt cellar, 1 buffalo robe.

And Mr. B. F. Robinson reports that the following are in his possession; to wit:

— 1 large spy-glass, 1 box for mineral tests, 2 geological picks.

Mr. Robinson reported to the Board that there is due from the Board to Michael Anbuison, for balance of services as Chainman on the Osage River Survey, the sum of fifty-one dollars and eighty-seven cents, - \$51 87

And also to Edward Davy for services as Chainman on the same survey, the sum of fifty-four dollars and seventy-five cents, - 54 75

Which accounts amounting to - \$106 62

The Board recognizes and allows.

And Mr. Robert White, late Commissioner on the Merrimec River Survey, states that there is due for services rendered on that survey—

To Joseph Canonge, boatman, - \$105 33

To John Page, flagman, - 68 75

Which two accounts amounting to - \$174 08

The Board recognizes and allows.

On motion,

Ordered, That the President prepare a statement of the accounts of the Board with the State, to be laid before the General Assembly, with the journal and other documents preparing to accompany the report of the Board; which order the President executes as follows:

The Board accordingly adjourned to meet at this place on the first Monday in May, 1811.

C. C. STURGEY, President.

CITY OF TOWN OF DORCHESTER 1810

Dr. The State of Missouri in account with the Board of Internal Improvements.

For expenditures on Osage River Survey,	-	-	\$3541 57
" do. on North Grand River, do.	-	-	1675 14
" do. on Salt River do.	-	-	1614 78
" do. on Morrimec River do.	-	-	3001 05
" do. on the Rail Road Route do.	-	-	3701 31
" do. by G. C. Sibley's account on sundry accounts,	-	-	3007 50
" do. by Wm. H. Morell, do. do.	-	-	1223 88
" do. on account Chief Engineer's salary,	-	-	2316 34
For amount of sundry claims outstanding against the Board,	-	-	-
per lists page, \$8788 91	-	-	3672 11
			<u>\$23,753 68</u>

Balance per contra, - - - 3599 43

Add the estimated expense of finishing the maps, plans, &c.,
now in progress, ordered by the Board, as by "the act" di-
rected—see the estimate page 88, - - - 1159 66

Amount of appropriation respectfully asked by the Board, \$4759 09

The State of Missouri in account with the Board of Internal Improvements. Cr.

For amount of the appropriation received at sundry times from the State Treasurer,	-	-	\$20,000 00
Amount received per B. F. Robinson, Commissioner for sun- dries resold,	-	-	114 25
Amount received per C. Davy, Commissioner for a boat resold,	-	-	40 00
			<u>\$20,154 25</u>
This balance due the Board of Internal Improvements,	-	-	3,599 43
			<u>\$23,753 68</u>

G. C. SIBLEY, *President.*

December 17th, 1840.

There being no further business to detain the Board in session, (nothing hav-
ing been heard from Mr. Davy,) and Mr. Meredith being very desirous to return
home, he moved to adjourn till the next regular meeting in course; and

The Board accordingly adjourned to meet at this place on the first Monday
in May, 1841.

G. C. SIBLEY, *President.*

CITY OF JEFFERSON, December 17th, 1840.

REPORT

MEMORANDUM—DECEMBER 29th, 1840.

The Board having adjourned, Mr. Davy not arrived or heard from, and Messrs. White and Robinson having resigned their offices as Directors, I am left alone here to attend to the business of the Board.

For the information of the Committees of the two Houses of the General Assembly on Internal Improvements, and all others officially interested, I give notice, that all the records, files, &c. belonging to the office of the Board, will be immediately deposited in the office of the Secretary of State, subject to the orders of the Legislature, or either branch, and to the inspection of all authorized persons; and, further, that I shall remain in this city during the present week, to answer any calls for information in my power.

G. C. SIBLEY,

President of the Board of Internal Improvements.

CITY OF JEFFERSON.

REPORT,

OF THE

BOARD OF INTERNAL IMPROVEMENTS,

TO THE GENERAL ASSEMBLY OF MISSOURI.

CITY OF JEFFERSON,

Dec. 29th, 1840.

SIR: I have the honor to lay before the General Assembly, the accompanying very full Report of the Board of Internal Improvements. Very respectfully, Sir, your most ob't servant,
G. C. SIBLEY,
Prest. of the Board.
The Honorable the President of the Senate of Missouri.

In conformity with the 13th section of the 5th article of the act entitle "an act to establish a general system of Internal Improvements in the State of Missouri," approved 11th February 1839, "The Board of Internal Improvements" appointed and organized by authority of said act, have the honor to lay before the General Assembly now in session, the following report:

By appointment of the Governor, the Board was duly organized at the City of St. Louis, the first week in May 1839, and immediately set about the performance of their prescribed duties—the early appointment of an experienced Chief Engineer, who sustains a high rank and reputation in his profession, enabled the Board to commence operations without any delay further than was necessary to obtain suitable assistants and laborers; and to provide instruments and proper outfits for the two engineering parties ordered. And as it was believed at the outset, that it would be but barely practicable to complete the five surveys ordered, within the time prescribed, with maps, plans, estimates &c., and that the means placed at the disposal of the Board for those objects would probably prove insufficient (*especially if the pay of the Directors, and salary of the Chief Engineer, and the necessary office expenses shall be taken from that fund,*) a vigorous exertion and rigid economy were strictly enjoined on all to whom were entrusted the work to be performed and the expenses to be incurred and paid.

The better to effect these objects, the Board deemed it most advisable to appoint "of their body" a Commissioner to superintend the disbursements &c.,

of each reconnoissance and survey; and to place such sum of money at the disposal of each Commissioner as upon careful estimates was considered adequate to defray the expenses of the work confided to him; requiring bond and security from each, as directed by the act, for faithful disbursements.

In pursuance of this plan, the Board placed \$3500 in the hands of B. F. Robinson and appointed him their commissioner on the Osage River survey.

\$2500, in C. Davy's hands as Commissioner on the N. Grand River survey.

\$1500, in H. Meredith's hands as Com. on the Salt River survey.

\$3000 in R. White's hands as Com. on the Merrimac River survey.

\$5000 in G. C. Sibley's hands as Com. on the Rail Road Route survey.

And in the hands of the Chief Engineer the sum of \$1000 for disbursement in his department, for instruments &c., making in all as thus appropriated the sum of \$16500, which is covered by bonds and security approved by the Governor; now on file in the office of the Secretary of State.

For the sake of brevity, reference is here made to the "Journal of the proceedings of the Board of Directors," which is herewith presented in full and from which the Legislature may readily obtain exact information in relation to the whole action of the Board and their Commissioners embracing especially the various accounts of expenditures with references to the vouchers in very ample detail.

All the surveys ordered by "the act" have been completed, as will be seen from the report of the Chief Engineer, which is herewith communicated, and to which the Board would respectfully invite the particular attention of the Legislature.

Appended to that interesting document, will be found the report of H. King, who was employed under an order of the Board passed 14th May, 1839, to make a geological examination of the Osage River country.

The plans, maps, &c., of the surveys, (so necessary for a right understanding of them) are not yet finished. They are now being prepared in the Chief Engineer's office, with all diligence, and will, it is expected, be all completed, together with the map of the State, as far as *that* can be finished for the present, by the 15th of February proximo.

All these maps, especially the large map of the State, will doubtless be properly appreciated by the General Assembly. They will all be faithfully and accurately executed from the very best data; and will be almost indispensable to the State, in the event of any future prosecution of the works of improvement to which they refer.

No copies of any of these maps have yet been ordered by the Board, for the use of counties, or for the office of the Secretary of State, because the additional expense would be considerable, and because such copies can be procured if desirable, at any future time.

All the Commissioners of the Board (except Mr. C. Davy) have made reports to the Board of their proceedings, and have filed detailed accounts of their disbursements, with vouchers to sustain them, in the office of the Board, and with the State Auditor, as has also the Chief Engineer. Full notices of all those accounts and reports will be found in the journal of the proceedings of the Board, already referred to in *this* report.

As nearly as can be readily ascertained, near enough for the present purpose, the several surveys have cost, exclusive of the maps, plans, estimates, and proportionate office expenses, as follows:

The Osage River, with the geological survey, 231½ miles,	\$3648 35
The North Grand River, 110 miles,	1725 00
The Salt River, 75½ miles,	1544 96
The Merrimac River, 172½ miles,	3208 63
The Rail Road Route, 115½ miles,	3701 31

The remainder of the appropriation (\$6171 75) has all been expended—\$1595 14 of it in payment to the President and Directors of the Board, *as such*, and to their Secretary; and for books, stationery, office rent, and other contingent expenses of the Board—\$2316 34 to the Chief Engineer on account of his salary—\$477 68 for instruments—\$1379 57 for services of engineers and draughtsmen, in office, and \$403 08 for office and field furniture, and other contingent expenses of the Engineering Department.

In carrying into effect the act of the Legislature, the Board are well satisfied that they have faithfully performed all their duty; and they can testify, also, to the zeal, industry, perseverance and efficiency of the Chief Engineer and his Assistants, without which it would have been entirely impracticable for the Board to have finished all the surveys ordered by "the act" within the present year. In executing the orders of the General Assembly, the Board have been governed in their expenditures by a proper regard for economy: but the funds placed at their disposal have been found inadequate to meet all their engagements up to the 15th inst., including the *per diem* pay and expenses of the Board, and salary of the Chief Engineer, amounting to \$4800 65, which payments the Board, with submission, are of opinion are not properly chargeable to the appropriation.

Not only has the whole appropriation been exhausted, but there are claims now outstanding against the Board and the State, that have been examined and allowed, amounting to the sum of \$3672 11; and in addition to this, it is estimated that the further expense of completing the maps now in hand, (a work enjoined on the Board by "the act," and which they have no authority to omit or suspend,) will amount to the sum of \$1159 66—making, altogether, \$4831 77; from which should be deducted \$72 68 in the hands of one of the Commissioners, in uncollected notes and accounts; and there remains to be provided by the General Assembly the sum of \$4759 09—all which are more particularly set forth in the accompanying journal of the Board, and the accounts on file at the disposal of the Legislature.

The Board respectfully ask of the General Assembly an appropriation of *four thousand seven hundred and fifty-nine dollars*, to enable them, by their Commissioner and Agent, to discharge all present arrearages, and to meet the estimated expenses now accruing, with such as may actually accrue in this service, to the 15th of February proximo.

There are now on hand in the Chief Engineer's office, a variety of instruments and articles of furniture, &c., as per inventory in the journal, to be disposed of as the Legislature may direct; and also a considerable collection of mineral and fossil specimens, of a highly interesting character; which, if properly arranged and preserved, would form the nucleus of a cabinet useful to the State.

In accordance with the law under which this Board has been organized, requiring them to ascertain "the most proper objects of improvement in relation to roads and navigable waters, and to report thereon to every General Assembly," the Board would now respectfully suggest, that, in addition to the objects they have recently had in charge, there are two others which are deemed of great public importance; and, as they would involve but a trifling expense,

they are respectfully recommended. The first is a road from Massey's Iron Works to a point on the Missouri River, about ten miles below the mouth of the Gasconade, to be surveyed and laid out as a State road by a competent engineer. For better information on this subject, reference is made to the accompanying letter of Mr. Massey to the Board.

The second object is a road from the town of Hannibal, on the Mississippi, by the most direct route to the town of Brunswick, at the mouth of Grand River, on the Missouri, to be also laid out under authority of the Legislature by a competent engineer, with a view to such future improvement by paving or otherwise, as may be deemed expedient by succeeding Legislatures. On this subject, reference is respectfully made to the report of Mr. Meredith to the Board, found at large in the journal of their proceedings.

Very respectfully submitted by order of the Board of Internal Improvements.

G. C. SIBLEY, *President.*

CITY OF JEFFERSON, December 29, 1840.

OF THE BOARD OF INTERNAL IMPROVEMENTS

REPORT

OF THE

CHIEF ENGINEER

OF THE BOARD OF INTERNAL IMPROVEMENTS.

To the President and Directors of the Board of Internal Improvements:

GENTLEMEN: I have the honor to submit the following report relative to the various duties devolved upon me by the act of 1839, establishing a general system of Internal Improvements, and by the act supplementary to the same.

The first section of the supplementary act directs "a reconnoissance and survey to be made of the River Osage, from its mouth to the town of Osceola, in the county of St. Clair; also, a reconnoissance and survey of North Grand River, from its mouth to Gallatin, in the county of Daviess; also a reconnoissance of Salt River, from its mouth to the Three Forks, in the county of Monroe; also, of the Merrimac, from its mouth to Massey's Iron Works, in the county of Crawford;" and that "a detailed report of the nature and character of the obstructions to the navigation of these rivers—whether it be practicable to remove them; and the probable cost of effecting the same shall be made to the General Assembly."

Section 12 directs a survey and reconnoissance of a route for a rail road from the city of St. Louis, leading by the nearest and best route to the Iron Mountain, in the county of St. Francois, and passing through the mineral region between said points; and that the Chief Engineer shall cause to be made such maps, plans, &c., as may be necessary to illustrate the route, and that he shall report the same with a minute and accurate estimate of the cost for the construction of said rail road to the next General Assembly of this State."

Although the law directing the examination of the different rivers has reference, solely, to removing obstructions to the navigation, I have, nevertheless, taken the liberty of making such suggestions as to what appears to be the best and proper kind of improvement for each river, as were indicated by the respective surveys.

OF THE OSAGE RIVER.—The point at which the survey of this river was commenced, at the town of Osceola, is about two miles below the mouth of the Sac, a tributary which has its source near the southern limit of this State, and which, at its confluence with the Osage, is of the same apparent size as that stream. The Osage proper has its source far beyond the boundaries of this State, in a direction westwardly from the point where it receives the Sac.—The extent of country drained by the Sac is 2052 square miles, and of that by the Osage Fork, is 1332 square miles within the State, besides a vast country

of undefined extent beyond its western borders. The main swell of these two streams is rarely coincident. The Sac, rising far in the South, contributes its accession of waters, at the breaking up of winter, in advance of the rise from the western fork; and, during the other wet seasons of the year, the great extent of country drained by these streams, and the remote points in which they have their source, preserves to the river, below their confluence, for a long period, a nearly uniform quantity of water. The most important tributaries that afterwards unite with the Osage, are the Pomme de Terre and Grand Rivers, above the town of Warsaw, and the Niangua, sixty-four miles below it. These tributaries, though large, do not appear to add much to the permanent volume of the stream; they do, indeed, by local rains, occasionally produce a rise, which soon subsides, their chief utility consisting in re-placing the waste of the river from evaporation and filtration. To this purpose, the Niangua is admirably adapted, its main supply being in a few large springs which gush out in perennial rivers.

The right bank of the river at Osceola, is limestone rock—the left alluvial bottom; both reach above high water, and their steepness is such as to occasion but little variation in the surface width of the river during its various fluctuations. This width, where the survey was commenced, and when the river was stated to be at its ordinary stage, was 317 feet, and the depth 7.7 feet, with a current moving at the rate of about two miles per hour. This characteristic of alluvial bottoms on one side, and rocky bluffs on the other, is preserved, with few exceptions, to the mouth of the river.

The bottoms are narrow, generally elevated above high water, and are composed of sand, gravel, and alluminous matter, combined in such a manner as to form banks of such permanency as, in most cases, effectually to resist the action of the river. The rocky banks with which these bottoms alternate, and which occasionally rise into perpendicular bluffs of from 50 to 250 feet elevation, are of the tertiary formation of Bakewell, and are generally silicious limestone, with occasionally large masses of sand-stone; and the deposits which are brought into the river by its tributaries, are detritus from these rocks, with small angular fragments of silicious rocks which abound upon the ridges of the interior, and which are also more or less intermixed with the soil of the prairies. These deposits, whether brought into the river by its tributaries, or derived from the abrasion of its banks, appear to be very stationary, the force of the current of the river not being sufficient to put them in motion after they have once subsided in it. The obstructions to the navigation of the river consist of shoals formed by deposits of this description of material, which give to the bed of the river where they occur, great stability, and force it at high water to widen its channel by encroachments upon its alluvial banks, the coarser and heavier particles of which are added to the shoals already in existence, while the lighter ones are deposited where the water is less rapid, and accumulate into islands by which the water in the river becomes temporarily divided. At these points, in low water, the greater part of the whole fall in the river is accumulated, thus dividing it into a succession of pools and rapids. The river in these pools has a depth of from 3 to 12 and 15 feet, with a current scarcely perceptible, while, at the shoals, it is either spread out in a thin sheet of great rapidity, or divided by the islands, so as to afford in neither channel sufficient water for the purposes of navigation. In addition to shoals of this description, there is an obstruction known as the "Rock Rapids," where there is a fall of 1.65 feet in a distance of 200 yards, with a minimum depth of water of 3.3 feet. The difficulty here does not consist so much in the shallowness of the river as in the rapidity of the current and the agitation of the water occasioned by masses of

detached rock distributed through the channel. As the mouth of the river is approached, the character of the bottom land, and of the deposits, is also changed to some extent, there being more alluminous matter and less gravel entering into their formation. Owing to the general stability of the Banks, the obstructions from snags are not numerous; but, at a few points where this stability is wanting, the undermining of the river has occasioned a considerable accumulation of them. These will have to be removed; and, to prevent farther encroachments of the river, the banks must be protected by rock. The overhanging trees that have necessarily to be cut, are few; and should the plan proposed for the improvement of the river be executed, they will all be wanted in the prosecution of that work.

To improve the navigation at the shoals and rapids, it is proposed to concentrate the water by the construction of wing dams and jetties, of such height and extent at each locality, as a thorough examination shall appear to demand, with the view of preserving to the channel, at the ordinary stages of water, a minimum depth of four feet. In some cases, these dams will have to be thrown out from one side of the river only. In all these when the natural bank opposite the dam is alluvial, it is to be prevented from being undermined, and from abrasion, by a covering of loose rock.

The dams will be generally a little over four feet high, and will be constructed either of rock, or of rock, brush and coarse gravel combined. Whenever sluices are to be cut off, or it is necessary to connect any island with the main land, by a dam, it is proposed to construct it of crib work filled with rock in the usual manner. The loose rock in the channel at the Rock Rapids, and in the very few other points where they occur, will also have to be removed.

The use of rock in the different constructions suggested, and in the protection of such alluvial banks of the river as may require it, makes it necessary to observe that that material is every where abundant in the immediate vicinity of the river.

During the whole of the operations here suggested, it should be borne in mind that where the bed of the stream has acquired permanency, it should not be disturbed, if it be possible, by the concentration of the river, to get a sufficient depth of water without it. After the completion of the works, there may be some few points to which the dredging machine may be usefully applied; but it is not to be resorted to as a primary operation.

In order to elucidate more fully the extent and character of the river, and to present the pools and shoals more in detail, the following tabular statement has been compiled. The survey was commenced the 30th of March, and completed the 2d of August; and these tables exhibit the character of the stream reduced to the lowest stage of water during that period. It is stated that at some very dry seasons it gets lower, which is probable, as last season was one in which, although there was no very considerable freshet, there was in the whole season the usual quantity of rain.

TABULAR STATEMENT,
Illustrative of the character of the Osage River, from Osceola to its mouth.

DIVISION I.—FROM OSCEOLA TO WARSAW.

No. of Pool.	No. of Shoals & Rapids.	Length in Yards.	Fall in ft.	Minimum Depth.	Total length.		Total fall.	Character of Bed.
					Miles.	Y'ds		
1		2916	1.060	Ft. 2.50		1156	1.060	Gravel.
	1	500	1.930	2.40	1	1656	2.990	Loose Stones.
2		5100	1.036	2.40	4	1476	4.026	Gravel.
	2	200	0.410	3.00	4	1676	4.436	do.
3		900	0.220	4.50	5	816	4.656	do.
	3	100	0.500	3.00	5	916	5.156	do.
4		800	0.228	6.30	5	1616	5.384	do.
	4	300	0.980	3.10	6	256	6.364	do.
5		517	0.035	11.00	6	773	6.399	do.
	5	600	1.100	3.00	6	1373	7.499	do.
6		6167	1.175	4.00	10	500	8.674	Gravel & loose stones
	6	400	1.885	2.10	10	900	10.559	Loose Stones.
7		933	0.060	5.00	11	73	10.619	Gravel.
	7	500	1.345	2.50	11	573	11.964	do.
8		1867	0.385	5.20	12	680	12.349	do.
	8	900	2.040	2.50	12	1580	14.389	Loose Stones.
9		7700	2.030	3.00	17	480	16.419	Gravel.
	9	300	0.710	4.00	17	780	17.129	do.
10		2000	0.680	6.50	18	1020	17.809	do.
	10	200	0.980	2.40	18	1220	18.789	do.
11		1200	0.310	6.50	18	1420	19.099	do.
	11	200	0.660	2.50	18	1620	19.759	do.
12		2600	0.850	5.70	20	700	20.609	do.
	12	300	0.500	12.00	21	840	21.109	do.
13		1600	0.370	2.00	20	1000	21.479	do.
	13	400	1.140	3.50	21	1240	22.619	do.
14		4000	1.555	2.60	23	1620	24.174	do.
	14	700	0.950	3.20	24	660	25.124	do.
15		5300	1.410	2.90	27	680	26.534	do.
	15	200	0.630	2.40	27	880	27.164	do.
16		1900	0.305	5.50	28	1020	27.469	do.
	16	300	1.340	3.40	28	1320	28.809	do.
17		7900	4.065	5.29	33	420	32.874	do.
	17	800	0.930	4.50	33	1220	33.804	do.
18		5450	2.270	4.30	36	1290	36.074	do.
	18	400	0.480	3.50	36	1690	36.554	do.
19		2250	0.500	4.50	38	520	37.054	Gravel.
	19	900	2.310	2.70	38	1420	39.364	do.
20		6100	2.260	3.00	42	480	41.624	do.
	20	200	0.840	2.34	42	680	42.464	do.
21		4650	1.220	3.10	45	50	43.684	do.
	21	200	0.300	3.10	45	250	43.984	do.
22		1450	0.350	5.90	45	1700	44.334	do.
	22	200	0.500	2.80	46	140	44.834	do.

No. of Pool.	No. of Shoals & Rapids.	Length in Yards.	Fall in ft.	Minimum Depth.	Total Length		Total fall.	Character of Bed.
				Ft.	Miles.	Y'ds.	Ft.	
23		3200	0.450	7.00	47	1680	45.284	Gravel.
	23	200	0.500	2.40	48	20	45.784	Loose Stones.
24		1250	0.190	5.70	48	1270	45.974	Gravel.
	24	300	0.600	4.80	48	1570	46.574	do.
25		450	0.070	5.40	49	160	46.644	do.
	25	200	1.230	3.20	49	360	47.874	do.
26		8200	2.285	4.10	53	1620	50.159	do.
	26	300	0.740	2.20	54	160	50.899	do.
27		5000	1.130	2.30	56	1640	52.029	Rocky.
	27	100	0.540	2.80	56	1700	52.549	do.
28		2100	0.140	3.30	58	320	52.709	do.
	28	600	1.420	2.60	58	920	54.129	do.

DIVISION 2.—FROM WARSAW TO NIANGUA RIVER.

29		3100	0.565	4.90	60	500	54.694	Gravel.
	29	400	1.710	2.80	60	900	56.404	do.
30		4200	1.225	4.40	62	1580	57.629	do.
	30	400	0.850	2.80	63	220	58.479	do.
31		11000	1.395	3.70	69	660	59.874	do.
	31	400	0.820	2.40	49	1060	60.694	do.
32		5200	0.790	3.50	72	980	61.484	do.
	32	700	0.800	2.40	72	1680	62.284	do.
33		4500	0.685	3.10	75	900	62.969	do.
	33	700	1.240	2.40	75	1600	64.209	do.
34		5900	0.895	2.30	79	460	65.104	do.
	34	2200	2.930	2.00	80	900	68.034	do.
35		2200	0.510	5.00	81	1340	68.544	do.
	35	400	1.720	2.00	81	1740	70.264	do.
36		3700	1.730	2.70	84	60	74.994	do.
	36	500	1.560	2.50	84	560	73.554	do.
37		1500	0.210	3.80	85	400	73.764	do.
	37	300	0.600	2.80	85	700	74.364	do.
38		6700	1.450	5.00	89	360	75.814	do.
	38	200	1.100	3.20	89	560	76.914	do.
39		800	0.330	8.90	89	1360	77.244	do.
	39	300	0.520	3.00	89	1660	77.764	do.
40		2000	0.405	9.10	91	140	78.169	do.
	40	300	0.510	4.20	91	440	78.679	do.
41		1900	0.250	5.00	92	580	78.629	do.
	41	200	0.650	4.30	92	780	79.579	do.
42		3700	0.465	6.30	94	960	80.044	do.
	42	200	0.640	3.30	94	1160	80.684	do.
43		2300	0.470	6.00	95	1700	81.154	do.
	43	700	2.200	3.00	96	640	83.354	do.
44		780	0.100	7.50	96	1420	83.454	do.
	44	350	1.350	3.20	97	10	84.804	do.
45		1100	0.100	10.00	97	1110	84.904	do.
	45	200	1.650	3.30	97	1310	86.554	Rock.

No. of Pool.	No. of Shoals & Rapids.	Length in Yards.	Fall in ft.	Minimum Depth.	Total length.		Total fall	Character of Bed.
					Miles.	Yds.		
46		2070	.645	5.50	98	1620	87.199	Gravel.
	46	400	.620	2.60	99	260	87.819	do.
47		3300	.605	6.40	101	40	88.424	do.
	47	300	.770	3.70	101	340	89.194	do.
48		1480	.120	6.70	102	60	89.314	do.
	48	200	.810	2.40	102	260	90.124	do.
49		2320	.275	4.00	105	820	90.399	do.
	49	300	.600	2.60	103	1120	90.999	do.
50		2740	.460	7.00	104	340	91.459	do.
	50	150	.700	3.00	105	490	92.159	do.
51		2410	.390	12.00	106	1140	92.549	do.
	51	600	1.400	2.20	106	1740	93.949	do.
52		970	.180	11.30	107	850	94.129	do.
	52	300	.500	2.80	107	1150	94.629	do.
53		830	.020	8.40	108	320	94.649	do.
	53	590	1.470	2.90	108	820	96.119	do.
54		1400	.400	6.00	109	460	96.519	do.
	54	300	.370	4.30	109	760	96.889	do.
55		7000	.590	4.20	112	1480	97.479	do.
	55	1100	1.340	2.10	114	60	98.819	do.
56		3100	.245	8.30	115	1400	99.064	do.
	5	600	1.490	2.30	116	240	100.554	do.
57		1100	.105	2.50	116	1340	100.659	do.
	57	300	1.500	1.50	116	1640	102.159	do.
58		3400	.260	5.40	118	1320	102.419	do.
	58	700	1.000	1.80	119	260	103.419	do.
59		5000	.315	2.00	122	180	103.734	do.

DIVISION 3.—FROM NIANGUA RIVER TO THE MOUTH OF THE OSAGE.

	59	600	2.420	1.50	122	780	105.234	Gravel.
60		1630	1.055	5.90	123	650	106.289	do.
	60	400	1.280	2.00	123	1050	107.569	do.
61		1000	.60	7.80	124	290	107.629	do.
	61	900	1.560	3.40	124	1190	109.189	do.
62		2070	.50	6.50	125	1700	109.239	do.
	62	600	2.170	2.60	126	540	111.409	do.
63		2200	.90	5.50	127	980	111.499	do.
	63	200	.400	4.00	127	1180	111.899	do.
64		400	.50	2.00	127	1580	111.949	do.
	64	590	1.180	1.30	128	320	113.129	do.
65		1100	.70	5.60	128	1420	113.199	do.
	65	200	.770	2.40	128	1620	113.969	do.
66		5800	.870	6.00	132	280	114.839	do.
	66	400	2.500	1.80	132	680	117.339	do.
67		4400	.440	5.40	134	1660	117.779	do.
	67	200	1.400	2.20	135	100	119.179	do.
68		1800	.15	6.70	136	140	119.194	do.
	68	600	1.500	3.20	136	740	120.694	do.

No. of Pools.	No. of Shoals & Rapids.	Length in Yards.	Fall in ft.	Minimum Depth.	Total length.		Total fall.	Character of Bed.
					Miles.	Y'ds.		
69		4820	0.250	Ft. 2.70	139	280	120.944	Gravel.
	69	300	1.000	2.00	139	580	121.944	do.
70		2500	0.165	5.70	140	1320	122.109	do.
	70	700	0.690	2.00	141	260	122.799	do.
71		1520	0.075	6.00	142	20	122.874	do.
	71	800	1.480	1.80	142	820	124.354	do.
72		1660	0.300	5.50	145	1700	124.654	do.
	72	300	0.690	2.50	146	240	125.354	do.
73		2050	0.080	5.00	147	530	125.424	do.
	73	400	0.740	2.80	147	930	126.164	do.
74		1550	0.545	6.10	148	750	126.709	do.
	74	600	1.530	2.60	148	1350	128.239	do.
75		2500	0.355	4.40	150	330	128.594	do.
	75	400	1.800	3.60	150	730	130.394	do.
76		2500	0.120	6.00	151	1470	130.514	do.
	76	400	0.980	2.80	152	110	131.494	do.
77		1600	0.755	2.50	152	1710	132.249	do.
	77	300	0.870	3.20	153	250	133.119	do.
78		9430	0.955	2.40	158	880	134.074	do.
	78	800	1.140	2.60	158	1680	135.214	do.
79		2240	0.040	4.00	160	400	135.254	do.
	79	400	1.870	2.40	160	800	137.124	do.
80		2860	0.110	4.00	162	140	137.234	do.
	80	600	1.550	2.90	162	740	138.784	do.
81		3440	0.235	4.00	164	660	139.019	do.
	81	300	0.300	4.20	164	960	139.319	do.
82		3200	0.880	2.20	166	640	140.199	do.
	82	300	1.130	2.60	166	940	141.329	do.
83		1040	0.025	12.00	167	640	141.354	do.
	83	500	0.900	4.00	167	1140	142.254	do.
84		2740	0.135	2.20	169	360	142.389	do.
	84	400	1.240	3.40	169	760	143.629	do.
85		3900	0.290	2.50	172	180	143.999	do.
	85	200	0.520	2.70	172	380	144.519	do.
86		3100	0.125	3.80	173	1520	144.644	do.
	86	700	0.770	2.60	174	460	145.414	do.
87		3200	0.390	5.40	176	340	145.804	do.
	87	300	0.970	2.70	176	640	146.774	do.
88		4000	0.300	7.60	178	1120	147.074	do.
	88	400	1.080	1.70	178	1520	148.154	do.
89		1900	0.140	12.00	179	1660	148.294	do.
	89	400	0.770	3.40	180	300	149.064	do.
90		1300	0.015	5.40	180	1600	149.079	do.
	90	300	1.120	3.20	181	140	150.199	do.
91		2300	0.345	3.50	182	680	150.544	do.
	91	300	0.460	3.20	182	980	151.044	do.
92		3370	0.200	11.00	184	830	151.204	do.
	92	600	1.480	2.90	184	1430	152.684	do.
93		2530	0.130	3.40	186	440	152.814	do.
	93	600	1.110	2.10	186	1040	153.924	do.
94		6500	0.350	2.30	190	500	154.274	do.
	94	300	0.420	3.90	190	800	154.694	do.
95		1700	0.100	9.00	191	740	154.794	do.
	95	700	0.900	3.70	191	1440	155.694	do.
96		1100	0.060	8.00	192	780	155.754	do.
	96	300	0.360	3.20	192	1080	156.114	do.
97		2300	0.110	12.00	193	1620	156.224	do.
	97	500	0.860	2.50	194	360	157.084	do.
98		2500	0.090	8.70	195	1100	157.174	do.
	98	700	0.500	8.90	196	40	158.674	do.
99		2300	0.075	4.50	197	580	158.749	do.
	99	300	0.790	2.80	197	880	159.539	do.
100		7800	0.220	4.00	201	1700	159.759	do.
	100	500	0.090	2.00	202	440	160.849	do.
101		9640	0.760	2.00	207	1280	161.609	do.
	101	350	0.450	2.80	207	1630	162.059	do.
102		39630	0.110	4.50	230	780	162.169	do.

DIVISION 1.

No. of shoals between Osceola and Warsaw,	-	-	25
Aggregate length of do.	-	-	10,500 yards.
“ fall do.	-	-	27.51 feet.
Total “ between do. and do.	-	-	54.13 do.
“ distance “ do. and do.	-	-	58 miles, 920 yds.

DIVISION 2.

No. of shoals between Warsaw and mouth of Niangua,	-	-	30
Aggregate length of do.	-	-	14,200 yards.
“ fall do.	-	-	33.42 feet.
Total “ between do. and do.	-	-	49.61 do.
Distance do.	-	-	63 miles, 1000 yds.

DIVISION 3.

No. of shoals between Niangua River and mouth of Osage,	-	-	43
Aggregate length of do.	-	-	19,350 yards.
“ fall do.	-	-	47.75 feet
Total “ between do. and do.	-	-	58.42 do.
“ distance “ do. and do.	-	-	108 miles, 621 yds.
Minimum volume of water per minute,	-	-	131,000 cubic feet.
Maximum range of river from high to low water, according to freshet in 1837,	-	-	27 feet.
Do. do. during survey in 1840,	-	-	22 do.

The mineralogical and geological character of the valley of this stream has been ascertained by an examination made by H. King, M. D., who was appointed by me for that purpose, under an order of the Board of Internal Improvements. A copy of his report (marked A.) is hereto appended. An examination of this report will serve to illustrate the object and utility of such examinations; and the industry and ability with which this duty has been performed will recommend the scientific gentleman to whom it was intrusted, to the favorable consideration of the Legislature, should it be disposed to prosecute investigations of a similar nature.

The estimated cost of removing the obstructions and making the improvements suggested in this report, is as follows, viz:

20,200 yards of wing dams and jetties, at \$7 50 per yard,	-	-	\$151,590
Removing rocks from channel,	-	-	1,500
“ snags and trees,	-	-	14,000
Constructing crib dams at sluices and islands,	-	-	11,000
20,000 square yards rock protection, at 40 cents,	-	-	8,000
			<hr/>
			\$186,000
Add for contingencies and superintendence 10 per cent.,	-	-	18,600
			<hr/>
Total,	-	-	\$204,600

For this sum it is confidently believed that the proposed improvements can be effected; by means of which a certain navigation, of from 4 to 7 months in each

year, can be secured to all boats not drawing more than 3.5 feet water. These boats should be built expressly for this trade, with engines of sufficient power to enable them to ascend the rapid current that in low water will always exist at the shoals. To enable them to thread the channel with accuracy, their engines should also be double.

In prosecuting this work, regard should be had to the amount of labor in the country: and the annual expenditures should be so limited as not to make so large a demand upon it as materially to increase its value. It is believed this expenditure should not be greater than \$50,000 in the first two years, and that the first operation should be to remove the snags and rocks from the channel, and the impending trees from the banks, and any balance then remaining should be expended in the improvement of such shoals as shall appear most obviously to demand it.

The extent of territory, within this State, that will be directly benefited by this improvement cannot be less than 18000 square miles, a large portion of which is prairie of good quality, the more westwardly part being represented as unusually productive, as is also the valley of every water course throughout its whole extent. The eastern section, or that nearest the mouth of the Osage, is generally covered with timber, its surface is very irregular, and with the exception of the narrow bottom lands of the river and its numerous tributaries, is but illy adapted to agricultural purposes. For this deficiency in agricultural capability, there is, however, an abundant recompense in the very general diffusion of ores of lead, in the richness of the bottom lands, and the extended range for stock which those parts too rugged for cultivation will always furnish.

The inducements which the variety and excellence of this section of country holds out to industry and enterprise have drawn to it a large portion of the emigration that has come to this State within the last few years, and the home demand for articles of agricultural production consequent upon this emigration, together with the difficulties and privations to which the pioneer is always subjected, have in a great degree prevented him from turning his attention to the immense hinderance to his prosperity that exists in the heavy charges and expenses to which every article requiring transportation is subject. His salt and his iron, articles of indispensable necessity, and those other heavy articles of sugar and coffee, which, to an American farmer, are, from habit, of almost equal necessity, come to him so much enhanced in value, by the cost of transportation, as to absorb the products of his industry, diminished as they are in exchangeable value by the same cause. This expense of transportation is as essential an element in the consideration of the value of lands as the quality of the soil; and it becomes important to enquire more particularly into what, in this respect, is the present condition of this region. In doing this it will be placed in as favorable a point of view as its true position will warrant by assuming Warsaw as the central point at which its exchanges of products for supplies are effected. This town is situated on the Osage, 172 miles above its mouth, and 75 miles from Boonville, which is its nearest shipping port upon the Missouri. The distance from the mouth of the Osage to Boonville is by the river about seventy miles; but the charge for freight from St. Louis to either point is about the same. The cost of transportation from Boonville to Warsaw per one hundred pounds, is

\$1 00

From the mouth of the Osage to the same point by the improved navigation, it will probably not exceed an average of

40

Resulting in a saving per hundred of

60

By the census of this year it is ascertained that the white inhabitants of the district of country, that would in all probability get their supplies by this improvement, amounts to 64,000; and assuming 6 of these to a family, the number of families will be 10,666—Suppose that each of these families consume for all purposes, 14 bushels of salt of 50 lbs. each, the whole present annual consumption of this article amounts to 149,324 bushels, or 74,662 hundred, which at 60 cts per cwt. is

\$44,797 20

In addition to this, estimates made by gentlemen of great intelligence, and who have ample means of arriving at correct conclusions as to the consumption in this section of other articles of importation, place their amount at 20,000,000 lbs., or 200,000 cwt. which at the difference of 60 cents per hundred, makes an additional tax per annum of

\$120,000

The whole amounting to

164,797 20

At the same time the exchangeable value of the products of the country is from the same cause, diminished to a like extent, at least, or

164,797 20

Making a total annual loss of

329,594 40

Which sum is equal to the annual interest at 6 per cent. upon an investment of \$5,493,236 66,100. Thus showing that to this extent at least, the present wealth of the State would be advanced by the expenditure of a little more than \$200,000. But when in addition to this, attention is called to the extent of the country to be benefitted, to its great agricultural capabilities, to its mineral wealth and to the immense population it is capable of sustaining, it appears to be not only the interest but the duty of the State, to make such improvements, as shall place the people of this great division of its territory, as nearly on an equality with the rest of the citizens, as its resources, and the nature of the country will permit.

OF NORTH GRAND RIVER.—The country drained by this stream is, in its general character, prairie of moderate elevation, having its gently undulating surface indented with numerous streamlets whose margins are fringed with a thin growth of timber—The valley of the river is from one to five miles wide, terminated by banks rising boldly to the prairies, the slopes of which, are usually covered with timber—The bottoms are mostly prairie, with a narrow strip of woodland bordering the river.

The substratum of the whole of this section of country, is of the most recent coal formation, the only rocks in place, exposed by the abrasion of the river being the out-croppings of shale and bituminous coal, in horizontal strata. The immediate valley of the river is, generally, an illuvial deposit of sand, nearly impalpable, and forming a light clay of very little tenacity, the whole being covered with a dark vegetable mould of from two to four feet thick.—Its general elevation, above low water, is 22 feet, which is nearly coincident with the ascertained rise of the river in the highest freshets, the bottoms being seldom overflowed, and, never, but to a small depth.

The exceptions to this general character of the valley are in the few instances where it rises into banks of stiff clay, and in the more frequent points where the river impinges against the rocky substratum of the country—The highest of these clay banks, of which there are 6 in the whole distance surveyed, is about 50 feet, and the highest of the rocky banks, of which there are 25, is about one hundred feet; the elevation of most of them being about 25 ft. These clay banks are interspersed with septaria, a species of calcareous marl, and have imbedded in them boulders of granite, and of crys-

talized compact blue lime stone—Several of these banks, as well as those of shale exhibit an abundant efflorescence of sulphate of Iron; indeed, so plentiful is it that it was collected by the early settlers, and used in domestic dyes—Besides these geological, and mineralogical indications, iron stone of several varieties, some of which are very rich, was found to exist in large quantities, and also, on salt creek near the mouth of the river, a compact sand stone of a quality well adapted to the construction of heavy, and substantial masonry.

The survey of the river was commenced the 18th of August last in T. 59, N. R. 27, W. Sec. 16 on the west fork, $1\frac{1}{2}$ miles from the town of Gallatin, and which is, apparently, the nearest accessible point on the river from that place—From this point to the forks, a distance of 40 miles and 4400 ft. the fall is 48 ft. 11 inches—The least depth of water was $9\frac{1}{2}$ inches, and the minimum quantity 10,308 cubic feet, per minute—The natural obstructions to the navigation of this part of the stream consist in the trees that overhang its surface, and the snags that are imbedded in its channel; besides which, there is a dam erected about 4 miles above the forks, $4\frac{1}{2}$ feet high. A descending navigation, in high water, for small river craft, could be effected, by removing the trees, and snags, at an estimated cost of \$7,934, and by placing a lock to be built of wood, in the dam, it might be made navigable at full water, both ways for keel boats, at an additional sum of \$2,400. But the course of this part of the stream is too crooked for steam boat navigation at any time, and the quantity of water is too small, except when the river is very full.

From the forks to the mouth the distance is 69 miles 950 ft., and the fall is 50.69 feet. The main obstruction to the navigation of this part of the river exists in the falls which are situated 45 miles above the mouth.

The other obstructions consist of snags, and a few impending trees, the number of the former being 564, and of the latter 184. The obstruction at the falls, as they are called, does not consist in the amount of fall, which is only 1.64 ft. in 400 yds. and which, at high water, would be nearly equalized with the rest of the river, nor is it from the unusual shallowness of the water, for the minimum depth found here in the channel, was 2.2 ft. which is a fraction greater than in some other parts of the river, but, the real difficulty consists in the very sudden bend which the river is here compelled to make, by having its previous course interrupted by one of those rocky banks of shale and coal heretofore referred to, and against which, from the rapidity of the current, a descending boat could rarely avoid being thrown—In addition to which the gravel, which is deposited from a creek emptying in at the head of the falls, and the disintegrated particles of rock, which here forms the right bank, and the right half of the bed of the river, have accumulated into detached banks in the left half of the bed of the river, rendering the channel, so very intricate as to make it next 'o impossible for a boat to thread it, even should it escape the danger first referred to. To remedy these difficulties it is proposed to construct a jettee, at such a point above the head of the falls, as shall give to the current such a direction as shall compel it to enter the falls, in a line, which shall be a prolongation of the general direction of the channel through them; and to construct near the foot of the falls, upon the rocky half of the bed of the river, and which is dry at low water, another jettee of rock, to the height of 4 feet, by means of which, the river, when it rises, will be concentrated into the left half where the channel now is, and add to its depth instead of being spread out into a wide and thin sheet of rapid water—The left bank, at this place, is alluvial, and this contraction of the channel will have a tendency, when there is full water, to wear it away and again widen the channel, to guard against which, it must be protected with loose rock in the

manner known as riprapping, which should be so arranged as to make the descent of the river, through the falls, as nearly straight as the locality will permit. As the river was not at its lowest point, during the whole time of the survey, below the forks, the minimum quantity of water in the main stream could not be ascertained, but it can be approximated very nearly by assuming the east fork to furnish as great a supply in low water as the west, which would make the total quantity twice 10,308 cubic feet, or 20,616 cubic feet per minute.

The estimated cost of removing the obstructions and making the improvements suggested in this part of the river is \$19,787.

For the whole extent of the survey the river presents; with the exceptions above referred to, a plane of nearly uniform inclination—Owing to the general lightness of the material in which it is imbedded its banks are easily undermined and bars of sand are very liable to be formed, or their position changed, but from the same causes the current soon deepens its channel through them, making the depth of the water in all the shallow places so nearly the same, that in each division of the river, a boat that can pass one can pass all—and although the average fall per mile below the forks is not greater than that of the more rapid parts of the Missouri,* yet, in this river the more confined and smaller body of water in motion, and the greater sinuosity of its course, produces a much more gentle current.

The sources of this river are from beyond the northern boundary of this State, and its confluence with the Missouri is in T. 53 N., R. 20, W. S. 10, at the most northerly point that that stream attains in its whole course, eastwardly, from the mouth of the Kansas. The country drained by it is not only extensive, but of a quality for agricultural purposes, not exceeded by any of equal extent in the whole State; and it is confidently believed that an improvement of the river, at this time, from the mouth to the forks, would be of sufficient public advantage to induce the Legislature to make the small appropriation necessary to carry it into effect.

I will add, that the proper improvements for the valley of this river, and one which its extent and productiveness will one day require, is that of a canal, the main trunk of which shall divide at the forks and extend up the valley of either stream. The facilities for a work of this kind could no where be greater, nor the expense less.

OF SALT RIVER.—The survey of Salt River was commenced at the Three Forks, (Florida) the 30th of August, 1839, when the water was at a very low stage, at which it remained, with very little variation, during the whole of the subsequent month. The minimum quantity of water flowing in the stream, as ascertained by repeated measurements, was found to be 3085 cubic feet per minute, and the minimum depth of water, upon the shoals, 4 inches. The greatest range in the river is about 21 feet. The principal obstructions to the navigation of this stream consist in the frequent occurrence of shoals of rock and gravel, (66 in number,) besides which there are a few impending trees, and near its mouth some snags, that would have to be removed.

From the Three Forks to the mouth, a distance of 75½ miles, there is

* NOTE.—The average fall in Grand River is 8½ in. per mile. A mile of the Missouri next above the mouth of the Osage was measured, on its south margin, and the levels taken with great care, and the fall was found to be 9½ inches—Another mile was also measured and levelled immediately below the mouth of Grand River, and the fall was 6½ inches. The river at the time of making both these measurements was nearly at its lowest stage, and judging from the rapidity of the current at these points compared with its general velocity, the least of these results is probably greater than its average fall per mile.

103.9.00 feet fall, not equally distributed, but, accumulated into rapids, having pools between them, nearly stagnant at low water. These pools have at all times a depth of from 4 to 12 feet, while the declivity of the shoals is so great as to discharge the water with such rapidity as to prevent any concentration of it upon them, except at times of high water, sufficient for the passage of boats. Neither is the quantity of water large enough to afford a permanent supply to an independent canal of the dimensions necessary for the passage of steam boats. The only improvement of which the river is capable, is by a connected series of locks and dams, constructed with great care, so as to reduce the leakage to the lowest possible quantity. By such an improvement, it could be made navigable at all times when not obstructed by ice. The material necessary to execute a work of this kind, can be easily obtained, both timber and rock being abundant, and convenient to the points where they would be required to be used. The construction of locks adapted to the passage of steam boats, even of a small class, will, nevertheless, be attended with very considerable expense.

In considering the adjustment and location of the dams and locks, two plans suggest themselves: one to place the dam at the head of the rapid, and to locate the lock at its foot, so as to include the fall in the rapid in the lift of the lock. This method will diminish materially the number of dams and locks, but it will involve the necessity of higher dams and of a connecting canal between the two pools; it will also add materially to the quantity of masonry in each lock, and make it necessary to construct an abutment of the dam, which, on the other plan, would be furnished by the river wall of the lock. The other plan contemplates the erection of the dam at the foot of the rapid, of sufficient elevation to give the required depth of water at its head, and to abut one end of the dam against the river wall of the lock. This plan would require a greater number of dams, but much less masonry. By the first plan, the banks of the connecting canal and the walls of the lock would be elevated above high water—by the last, the lock wall would be raised about 8 feet, only, above the crest of the dam, which would be low, and over which boats would pass at such stages of water as would submerge the lock. The first plan would be the most expensive, but, also, the most perfect; on either plan, the widest place in the locality requiring a dam should be selected in order to give the greatest possible space for the passage of the stream.

It is proposed that the dams shall be crib-work, secured to the rocky bed of the river by iron bolts; the foundation to be protected by sheet pilings; the cribs to be filled with stone and sheeted with plank; and the whole to be thoroughly gravelled with coarse river gravel. The masonry, both of the abutments of the dams and of the locks, to be hammer-dressed range work, laid in water lime; the hollow quoins and coping of the locks to be cut—in addition to which, there will be, on each inside face of the lock, and at equal distances from the hollow quoin, two columns of cut-work, five feet wide each, extending from the floor to the coping, and projecting slightly beyond the general face of the lock, in order to give a smooth rubbing surface to the boat as it rises and falls in the chamber.

Should the Legislature determine not to embark at this time in the improvement of this stream, some provision should be made to prevent any obstruction to its navigation by the erection of dams, without any provision for the passage of flats and other river craft. To this there could be no valid objection, as this stream is recognized by the General Government as a navigable one, and has also been declared to be so by the legislative authority of this State.

ESTIMATE.

Minimum depth of water in pools to be 4 feet; locks 155 feet long in the clear; 31 feet wide do.; 4 feet minimum depth of water on mitre sill.

HIGH LEVEL, WITH CONNECTING CANALS.

Dam, average height of 11 feet, crib-work, sheeting, gravelling, &c., complete, - - - - -	\$5253 00
Masonry in abutments, 504 perches, at \$4 00, - - - - -	2016 00
Masonry in each lock, 3500 do. at \$5 00, - - - - -	17500 00
Hollow quoins, coping, wells for gate chains and columns, - - - - -	2035 00
Excavation of foundation, foundation timbers and planking, puddling and embanking, - - - - -	3236 00
Gates and mitre sills, iron work, drums, chains, friction rollers, cranks, &c., - - - - -	3250 00
Total cost of each lock and dam, - - - - -	<u>\$33,280 00</u>
Total number of locks, 11 x \$33,280 00: =	\$366,080 00
Constructing connecting canals, removing snags, &c., - - - - -	33,000 00
Total cost high level, - - - - -	<u>\$399,080 00</u>

LOW LEVEL—DAM AND LOCK CONNECTED.

Dam, average lift of 9 feet—crib-work, sheeting, gravelling, &c., complete, - - - - -	\$4171 52
Masonry in abutments, 160 perches, \$4 00, - - - - -	640 00
Do. in each lock, 1472 do. 5 00, - - - - -	7360 00
Hollow quoins, coping wells for gate chains and columns, - - - - -	1250 00
Excavation of foundation, foundation timbers and planking, puddling and embanking, - - - - -	2600 00
Gates, mitre sills, iron work, drums, chains, friction rollers, cranks, &c., - - - - -	2250 00
Total cost of each lock and dam, - - - - -	<u>\$18,271 52</u>
21 locks and dams, at \$18,271 52, - - - - -	383,701 92
Removing trees and snags, - - - - -	8,000 00
Total cost low level, - - - - -	<u>\$391,701 92</u>

OF THE MARAMEC RIVER—The survey of this river was commenced at Masses's Iron Works, which are situated two hundred yards below the "Head Spring," which is the main source of the Maramec. The quantity of water flowing from this spring was ascertained by measurements, taken at an unusually low stage of water, to be 5,658 cubic feet per minute. About eight hundred yards below the Iron Works, the waters of the "East Fork" are added to those of the spring, and the quantity is increased to 8,304 cubic feet per minute. In its farther progress, the river receives constant and frequent additions to its quantity of water, and after passing the Courtois, its volume, at ordinarily low water, amounts to 57,200 cubic feet. It afterwards receives large contributions from the Bourbeuse on the north, and from Big River on the south, besides

supplies from many minor streams; but the river was always, during the survey, at too full a stage, after reaching those streams, to allow of its minimum quantity being ascertained. It may, however, be approximated by supposing that, after allowing for evaporation and absorption, the quantity would be doubled, or be equal to 114,400 cubic feet per minute.

From the base of the dam, at the "Head Spring," to the mouth of the Courtois, the distance is $38\frac{1}{4}$ miles, and the fall 140 feet; from the mouth of the Courtois to the mouth of the Bourbeuse, the distance is $49\frac{3}{4}$ miles, and the fall 157 feet; from the mouth of the Bourbeuse to the mouth of Big River, the distance is 28 miles, and the fall $51\frac{1}{2}$ feet; and from the mouth of Big River to that of the Maramec, the distance is $56\frac{1}{2}$ miles, and the fall 42 feet; the total distance being 172 miles, 1008 yards, and the total fall $390\frac{1}{2}$ feet. The greatest fall at any one place, is at a point about 15 miles from its head, where the descent is 6.10 feet in 950 yards, with a minimum depth of 1.20 feet. At Sherman's Bend, $61\frac{1}{2}$ miles below this, there is also a fall of 6.100 feet in 2000 yards. The remainder of the fall is generally distributed into rapids of great length, giving to the current of the river, at ordinarily full water, great velocity, every where, except near its mouth.*

The bed of the river is usually composed of disintegrated particles of the rocks which constitute the geological formation of this region. These rocks are generally silicious limestone, intermixed with chert or horn-stone. They rise into high, and, frequently, perpendicular bluffs, at the foot of which, either on the one side or the other, the river flows, leaving, on the side opposite the bluffs, a narrow strip of bottom land. These bottoms, when in a state of nature, are covered with a thick growth of heavy timber, and their elevation is in most instances less than the height to which the river rises in its main freshets; the greatest range of which, as far as ascertained with certainty, is about 20 feet.

The country which borders the river on either side is elevated and broken; and the covering of soil upon its rocky substratum, is too slight to absorb much of the downfall water, which is, consequently, quickly drained into the minor streams and precipitated into the river, thus causing it to rise suddenly; while, at the same time, its fall is so great as to carry off, as quickly, this accumulation of waters, upon the cessation of the cause that produced it. These great and sudden fluctuations in this river, together with its great fall, effectually preclude any improvement of its natural navigation that shall have any claims to permanency or utility.

An artificial navigation could be effected by a connected series of dams and locks. These dams could not be raised to more than an average height of 10 feet above the bed of the river, without great damage to all the bottom lands. Dams of this elevation would give to the rocks an average lift of 6 feet, upon the supposition that the navigation was adapted to vessels drawing $3\frac{1}{2}$ feet.—This would require the erection of 65 dams, and the construction of the same number of locks; which, upon the supposition that the locks are made of dimensions sufficiently large to pass the smaller class of steamboats, and built in the cheapest manner, of durable materials, would cost not less than \$45,000 each dam and lock, or \$2,925,000 in all. But, the frequency of these locks, occurring, on an average, once in every 2.5-8 miles, together with the abrupt curvature of the river, will prevent the economical use of steam in its naviga-

* NOTE.—It was ascertained by the survey for a rail road to the Iron Mountain, that the surface of the water in the Maramec, at Dougherty's Ferry, twenty-one miles above its mouth, is nearly coincident, at low water, with the surface of the water in the Mississippi, at St. Louis, when it is at its usual stage of summer navigation.

tion. The expense for a slack water navigation for keel boats, would be as great as that above estimated for steam boats; for the cost of the dams would be the same, and the diminished cost of the locks would be fully compensated by the expenditure necessary to construct a towing path on one side of the river throughout its whole extent.

An independent canal, with its levels so adjusted as to give the greatest facilities for manufacturing purposes, would be, decidedly, the best improvement for the valley of this stream. This could probably be effected for \$20,000 per mile, or for the total sum of \$3,440,000. This sum is large, and, probably, beyond the present ability of the country; but when the great public benefit that would be attained by the construction of a navigable communication to the mountains of iron ore that lie at the head of the river, and the mineral wealth that is in its vicinity, added to the immense water power that would be created by this improvement, are considered, it is but the reasonable hope of the patriot that the time may soon arrive when either the capital and enterprise of individuals, or the resources of the State, shall be directed to the prosecution of this work.

It is difficult to conceive a position having greater facilities for the manufacture of iron than the one occupied by "Massey's Iron Works." They are only 200 yards from a fountain which perpetually sends forth a volume of water, of nearly uniform temperature, and equal to the propelling of machinery to any desirable extent; and they are supplied with ore, of the richest quality, excavated from the side of a ridge that might well challenge the name of mountain, and which is not more than 600 yards from the furnace. In procuring this ore, all the material excavated, with the exception of here and there a small quantity of soil that has accumulated amongst the ore at the surface, is hauled to the furnace and smelted, without the previous process of roasting to free it from its impurities, and yields 65 per cent. of pig metal, which, when manufactured into bars, forms an iron that, in useful qualities, has no superior in this country. The wooded country that surrounds these works, is extensive, and the want of fitness of the greater part of it for cultivation, will always secure to them an abundant supply of charcoal; in addition to which, there has been a recent discovery of bituminous coal within 18 miles of the works, which is of good quality and supposed to be of great extent. But with all these facilities for the production of iron, these works, although directed by one of the most experienced, energetic and intelligent of manufacturers, are of but limited utility, and they supply but a small section of country, owing to the absence of any improvements by which the economical transportation of this heavy article can be effected.

OF THE IRON MOUNTAIN RAIL ROAD.

The Iron Mountain is situated in the county of St. Francois, upon the head waters of the river of that name, in Sec. 31, T. 35, N. R. 4 E. of the 5th principal meridian. It is 60 miles due west from the Mississippi, and 65 in a direct line S. 16 deg. W. from St. Louis. It is a mass of rich iron ore projected to the height of 205 feet upon an elevated range of country, extending from the Rocky Mountains to the Mississippi, and to some sections of which, the name of Ozark Mountains has been given. This range has an elevation at the base of the mountain, of 695 feet above the Mississippi, at St. Louis; and it here forms the dividing high lands from which the waters of the St. Francois descend, southwardly, to the Mississippi, and those of Big River pursue their tortuous course, northwardly, to the Maramec, and with that stream mingle with the Mississippi, about twenty miles below the city of St. Louis.

The indirectness of Big River will add so greatly to the length of the contemplated improvement as, together with the rocky character of its bluffs, effectually to prevent the economical construction of the road along its immediate valley. The numerous tributaries, also, which enter this stream from either side, in their precipitate descent, have excavated deep ravines by which the whole country which borders it is broken into numberless ridges and hollows, whose general direction is transverse to a direct line of location for the road.—In addition to this, the ranges of high lands, from which these tributaries descend, are very indirect in their continuous course, and irregular in their elevation, with summits so narrow, and slopes so broken and abrupt, as to compel a line of location upon them to adhere, almost rigidly, to their crests. This is particularly true of the main high lands, on the east side of Big River, and which divide its waters from those of the Mississippi. These terminate on the Maramec, at a point nearly due north from where they unite with the Ozark range; yet, between these points, they pursue a zigzag course, running at one time boldly up the Mississippi, and at another, with an abrupt deflection, crossing to Big River, and forcing it to change its direction for long distances; when again suddenly leaving it, they stretch their rocky elevation, far from either stream, to the height of mountain grandeur, and, throwing out numerous ramifications, present no indications by which the line of their continuous prolongation can be conjectured.

Between the Maramec and St. Louis, the draining of the country is effected, mainly, by two streams, the Gravois and the Des Peres; both of which have a general direction, nearly at right angles, to the direct line of survey, for the road. These streams are deeply embedded below the general surface of the country, which is worn into numberless irregularities, and, in some instances, excavated into deep ravines by their tributaries in their descent to them.

It will be seen by the foregoing sketch, that the country to be traversed by the contemplated improvement presents neither continuous range nor valley, adapted to its location, and that its route is impeded by a succession of both, running transversely to its line of direction. To overcome these obstacles, two methods present themselves, both of which, according to circumstances, have been adopted—one by crossing the ridges, ascending to some favorable depressions in their summits, and then descending to the valley beyond; the other, by making a detour, turning the ridges and pursuing the valley as far as practicable. The latter plan increases the length of the road, the former decreases its capacity.

It is a peculiarity, which attaches to all the ridges crossed by the survey, that their northern and eastern slopes are much more gentle than their southern and western; this affects, unfavorably, the capacity of the road, the greatest rate of ascent being, in every case, against the greatest amount of tonnage.

The reconnoissance and surveys resulted in the adoption of the following route:

Commencing in the city of St. Louis, at the intersection of Fifth and Almond streets, the grade of the road being established so as to coincide with the grade of these streets at their point of intersection; the line, passing to the left of Chouteau's mill, proceeds up the southerly margin of his pond, and ascends the valley of the stream that supplies it to a summit east of, and near to, Mr. Russell's; it then descends to the river Des Peres, and crosses that stream near the residence of Mr. Carline. From the summit at Mr. Russell's to the crossing of the Des Peres, $3\frac{1}{4}$ miles; the line, for most of the distance, either passes through, or borders upon, a coal field; the distance from St. Louis to the centre of the field being about six miles. On this part of the route, the grades are very easy

till the Des Peres is approached, when the descent is at the rate of 40 feet to the mile. In ascending to the coal field, the strongest grade is at the rate of 18 feet per mile, and the whole country is of the most favorable character for the construction of the road. The Des Peres is crossed by a bridge 140 feet long, elevated 65 feet above the bed of that stream. After crossing the Des Peres, the line, by a cut 1200 feet long, and 10 feet greatest depth, reaches the valley of the Gravois, which it ascends to a summit near Mr. Yates. This summit is 19 miles from St. Louis, and is crossed at an elevation 185 feet above the base of reference, at the intersection of Almond and Fifth streets. The valley of the Gravois is favorable in its character, and its inclination is gentle, till the summit is approached, when it becomes so steep as to compel a grade of 52.8 feet per mile. Proceeding from this summit, the line descends by the valley of Sugar Creek to the Grand Glaze, and thence by the valley of this creek to the Maramec, which it crosses at Dougherty's Ferry. The valley of Sugar Creek falls very rapidly, and the descent along it varies from 52 to 70 feet per mile, the line being sustained on the rocky slopes which bound it on either side. From the junction of Sugar Creek with the Grand Glaze to the Maramec, the grades are light and the ground favorable. The Maramec is crossed by a bridge 400 feet long, elevated 30 ft. The distance to this point is $25\frac{1}{4}$ miles. After crossing the Maramec, the line is carried over the bottom lands, on its south side, till it intersects Williams' creek, near the residence of Mrs. Lambkins; it then ascends the west fork of Williams' creek to its source, in a ridge which divides its waters from those of the Antire, the whole distance passed over to this point being $28\frac{3}{4}$ miles. Here the ridge presents an obstacle which cannot be overcome except by piercing it with a tunnel, or by means of two inclined planes, with stationary power; one plane being required on either side. Tunnelling has been adopted in this case, and in such others as occur on this route, where the same alternative is presented. This tunnel will be 800 feet long. Descending from the tunnel to the valley of the Antire, a deep ravine, made by one of its tributaries, is encountered and crossed, 78 feet above its lowest depression, by a bridge 900 feet long. The descending slope of this ridge is very uneven, and will involve a large amount of rock excavation. Upon reaching the valley of the Antire, its ascent is commenced, and pursued over favorable ground to its source in the ridge, dividing, at this point, the waters of the Antire, which falls into the Maramec, from those of Crooked Creek, which descend into Big River. This ridge has also to be pierced by a tunnel 975 feet long. Hanging on to the rocky banks of Crooked Creek, and falling at the rate of 70 feet per mile, the line descends to the Big River bottoms, in $2\frac{1}{4}$ miles. It then follows the valley of Big River, making occasional cut-offs, to the mouth of Dry Fork, about one mile south of Widman's mill. This section consists, mainly, of Big River bottoms, interspersed with a few rocky bluffs, none of which present any serious obstacle. The mouth of Dry Fork is at the total distance of $52\frac{1}{4}$ miles. Ascending Dry Fork, 10 miles, over extremely favorable ground, to its source, where it interlocks with Bolduc's Creek, and descending by that creek, $3\frac{1}{4}$ miles, at the rate of 70 feet per mile, the line is again on Big River, having effected, by this cut-off, a saving in distance, over the meanderings of the river between the same points, of about 60 miles—Big River is crossed by a bridge 45 feet high and 200 feet long. The whole distance to this point is $65\frac{1}{4}$ miles—two miles from this crossing, the line reaches the Mineral Fork, and then ascends its valley and that of Fourche a Renault, to its source, in an elevated range of flint ridges crowned with forests of yellow pine. Here the line is $94\frac{1}{4}$ miles from St. Louis, having pursued the valley of Mineral Fork and its tributary $26\frac{1}{4}$ miles. This section, taken as a whole, is over very favora-

ble ground, the only obstacle presented, tending to enhance the cost of the work, consists in the necessity of encountering a few bluffs of rocks, and of occasionally crossing the stream, either to avoid others more extensive, or to preserve, to the line, a proper direction.

The line is continued through the flint ridge by a tunnel 900 feet long, and immediately encounters a tributary of Clear Creek, and, adhering to the slope of the ridge on its western side, descends, at the rate of 70 feet per mile, to Clear Creek, and, crossing Clear Creek at an elevation of 34 feet, and passing by Mrs. Aldridge's, it reaches the west fork of Big River, near Mrs. Bryant's, about one mile below where it is crossed by the Courtois road. The distance from the summit of the ridge to the crossing of Clear Creek, is $3\frac{1}{4}$ miles, and thence to Big River 2 miles. From the summit to Clear Creek, the line is upon a rocky side-hill; from Clear Creek to Big River, it passes, by an undulating grade, over elevated ground of a favorable character. This second crossing of Big River is effected by a bridge 150 feet long and 20 feet high.

After crossing Big River, the line ascends, by easy grade, to the elevated plateau of Bellevue valley, which it traverses in a direction nearly east, and passing about $1\frac{1}{4}$ miles south of Caledonia, and crossing Cedar and Reed Creeks, it ascends the valley of Saline Creek to a depression in the Ozark range, elevated 614 feet above the base of reference. Traversing this depression, and running in a direction a little north of east, over ground gently undulating; in $3\frac{1}{2}$ miles, the line reaches the Iron Mountain, in the county of St. Francois, crossing, in this distance, a tributary of St. Francois river.

The total length of the rail road, from St. Louis to the Iron Mountain, by the located line, is $115\frac{3}{4}$ miles.

In tracing this location, curves of large radii have, with one exception, been adopted. This occurs at the northern approach to the tunnel at the head of Crooked Creek, where a radius of 955 feet is the largest that can be obtained without extending the curve into the tunnel. The grades are more unfavorable, there being, in five different localities, a departure from a horizontal line at the rate of 70 feet per mile. The whole extent of this grade is $11\frac{1}{2}$ miles; the greatest in any one place being $3\frac{1}{2}$ miles; and, in every case, the plane is either so long, or so unfavorably situated, as to preclude the momentum of the train from entering, as an element, into the calculations, as diminishing the power necessary to overcome its ascent. This grade, consequently, establishes the limit of the capacity of the road, which it reduces to a little less than one-fifth of that of a level one;—for, the resistance from friction being taken at 1.280 of the insistent weight, or eight lbs. per ton, an engine weighing ten tons, and which would be able to drag 300 tons on a level, would only be equal to the hauling of 56 tons, exclusive of its own weight, up a plane of 70 feet per mile. To make a road of this character at all efficient, engines of the largest class must be used upon it, and its superstructure must necessarily be of the strongest and most stable character.

The plan proposed, is that of longitudinal bearing timbers, having a continuous support upon broken stone, connected by cross ties of wood, and capped with an iron rail weighing 40 lbs. to the yard. From St. Louis to the Maramec, 25 miles, a double track is contemplated; for the remainder of the distance, a single one, with occasional turn-outs.

The law, under which this survey was executed, directs that such survey shall be made by the nearest and best route from St. Louis to the Iron Mountain, in the county of St. Francois, but prescribing, also, this additional condition, that it shall pass through the mineral region between those points. In this particular, this survey and location fully accomplishes the intention of the

Legislature, by passing 41 miles, centrally, through that region. In addition to which, it traverses the St. Louis coal field nearly two miles, and the pine forest, where it crosses it in Washington county, six miles. This forest has an average width of eight miles, and it is reported to extend, in a southwesterly direction from where it is crossed by the line, quite to the confines of the State. In it, and in the vicinity of the line, saw-mills, propelled both by steam and by water, are already erected; and the lumber produced by them wagoned to the Mississippi, and delivered in St. Louis at an expense for transportation of about \$15 00 per thousand. By the rail road, this expense, at the rate of five cents per ton per mile, would be \$7 50, which would enable this lumber to be furnished in St. Louis at a cheaper rate than any with which that market has been heretofore supplied. On this account, it would not only be in demand for all the purposes for which yellow pine is deemed the best material, but it would, in many cases, be substituted for more appropriate lumber.

The following is a synopsis of the estimate of the quantity of work to be done to construct the road, and of the machinery to be furnished to put the same in operation. In affixing the prices for labor and materials, regard has been had to the enhanced value of both, consequent upon the increased demand, that would be created by the work, during its progress of construction. The prices per cubic yard for the excavation of earth, and for embankment, varies, according to local circumstances, from 12 to 30 cents; excavation of rock from one dollar to one twenty-five; masonry from two to eight dollars per perch; and bridge superstructure from 20 to 25 dollars per lineal foot. The arch of the interior of the tunnels is supposed to be made of brick, at \$15 per thousand; the springing walls, of rock, at \$4 per perch, and these two items, together with the excavation, which will amount to ten cubic yards per foot lineal, is estimated to cost forty dollars per foot. The masonry at the entrance of the tunnels will be hammer-dressed range work, with cut coping and rusticated pilasters, jambs and voussoirs; the cost of which, to each tunnel, is estimated at \$6,340:

SYNOPSIS OF ESTIMATE.

Grabbing and clearing, - - - - -	\$11,600 00
Excavation of earth and embankment, 3,521,797 cubic yds.,	581,219 78
Do. of rock, 330,630 do.	412,237 50
Rock protection, or rip-rapping, 14,000 do.	7,000 00
Masonry, 17,392 perches,	129,103 90
Bridge superstructure, 2,550 lineal ft.,	58,050 00
Three tunnels, whole length, 2,920 do.	135,820 00
Superstructure, single track, 115½ miles, at \$9,100,	1,053,325 00
Do. additional track to Maramec, 25 do. \$9,100,	227,500 00
Do. side tracks at turn-outs, 5 do. " "	45,500 00
Turnouts and Revolving Platforms, - - - - -	16,000 00
Depots and Water Stations, - - - - -	52,250 00
Public and Private Road Crossings, - - - - -	4,417 00
Fencing and Damages, - - - - -	20,000 00
Engines, Cars and Coaches, - - - - -	188,700 00

Total, \$2,942,723 18

The annual interest on this sum, at 6 per cent. is \$176,563 30

The result of experience in the use of rail roads in this country, shows that the expense of keeping up a road and its machinery, together with cost of transportation and superintendence, amounts, when a business sufficiently large is done to sustain the work, to 60 per cent. of the gross receipts. This is the result, not only upon the best constructed and best managed roads in this country; but in Belgium, as stated by the Chevalier de Gerstner, it amounts to 65½ per cent. of the gross income; and on the Liverpool and Manchester road, according to the official statements of that company, the gross receipts for the year terminating the 30th June, 1836, and the fourth year of its operation, were £192,018, and the expenses £116,442, which is 60½ per cent. of the gross receipts.

Assuming, then, that the expenses of the road now under consideration will be 60 per cent. of its gross receipts, and that the cost will be as above estimated, \$2,942,723 18, the annual receipts must be \$441,408 47 to produce a clear income of \$176,563 39, or 6 per cent. on the capital invested; and it is believed not to be prudent to base any calculations upon the probability of procuring money at a less rate of interest.

In estimating the sources from which this sum is to be derived, it is necessary to consider the enlarged ability of the country, consequent upon the construction of this work. From the increased facilities and diminished cost of transportation, the production of lead would be quickly doubled, and its manufacture into shot, sheet lead and lead pipe would be introduced upon the water courses traversed by the road. The pine forests will contribute largely to the tonnage of the road, while value will be given, and population added to an extensive tract of country hitherto esteemed nearly worthless. The coal fields would be explored, not only for fuel for domestic purposes and the workshops of the trades, but, also, for the smelting and manufacture of iron, and the creation of gas. The iron which is found scattered along the route of the road, and that immense accumulation of ore forming the mountain, will attract the capitalist, excite the skill of the artizan and the enterprise of the merchant, and stimulate the energies, and reward the labors, of all the producing classes. The addition to the wealth, to the population, and to the production and consumption of the country, would swell the amount of tonnage, while the necessities of frequent intercommunication would give to the road a large amount of transportation of persons, which would be farther increased by numbers of the scientific and the curious that the mountain would constantly attract to it.

It is, therefore, estimated that, upon the completion of the work, there will be transported upon it 6000 tons of lead, an average distance of 75 miles, at \$3.75 per ton.	\$22,500 00
Three millions feet of lumber, an average of ninety miles, at \$7.50 per M.,	22,500 00
Four thousand tons provisions and merchandize, an average distance of eighty miles, at \$5 per ton,	20,000 00
Coal consumed in St. Louis, in domestic purposes, in smith shops, in furnaces, and manufactures of iron, in stationary steam engines, and in the creation of gas, 1,000,000 bushels, carried six miles, at 1½ cents per bushel,	15,000 00
The transportation of persons for all distances, is assumed to equal twenty-five per day, each way, over the whole road, which is fifty passengers per day for 365 days, at \$5.75 each,	104,937 50
Transportation of the mail,	5,000 00
Making, derived from other sources than the production of iron, the sum of	\$189,937 50

Which deducted from the gross revenue required, - 441,408 47

Leaves to be created by the transportation of iron, and of all articles necessary to its manufacture, the sum of - - \$251,460 97

In order to ascertain the quantity of iron that will have to be manufactured annually, so that its transportation, and that of all other articles necessary to its production, shall yield to the road a revenue equal to this deficiency, it becomes necessary to determine the probable point of its manufacture, and where the cost of its production and delivery in market, will be reduced to a minimum.

The manufacture of a ton of iron consumes, throughout the whole process, five hundred bushels of charcoal, or, when the hot blast is used, three tons of bituminous coals. The expense of charcoal, together with the immense quantity required, forbids its use when a large amount of iron is to be produced, and mineral coal must be resorted to. Of this coal, there is no known field nearer the mountain than that through which the road passes, six miles from St. Louis, and 109 from the mountain. The cost of transporting three tons of coal to the mountain, 109 miles, at five cents per ton per mile, is - - \$16 35

The cost of transporting one ton of iron from the mountain to St. Louis, 115 miles, at the same rate, is 5 75

Making the total cost of transportation per ton of iron, - - \$22 10

In addition to this, the expense of its production, at the mountain, will be increased by the necessity of using steam instead of water as the propelling power of the machinery employed in its manufacture. This difference is stated by the directors of the Lehigh Coal and Navigation Company, to amount to \$82 per horse power per annum, where the coal used for generating steam costs two dollars per ton.

It, in the next place, becomes necessary to enquire whether the ore cannot, with more economy, be transported, on the road, to some suitable locality where water power, sufficient for all purposes, can be commanded, and where coal can be conveniently had. In this view of the subject, the extreme richness of the ore has a favorable influence. This ore yields, on analysis, from 75 to 80 per cent. of iron; and it is believed that, practically, on a large scale, the product will not be less than 45 per cent. of bar iron; which would require the transportation of 2.22 tons of ore for every ton of iron produced.

For the purpose of erecting furnaces and machinery for the manufacture of iron, a position every way desirable is afforded where this road crosses the Maramec. The banks of the river are high, the bottoms elevated and extensive, and the water abundant. Its value as a manufacturing point is also enhanced by the consideration that every artizan and laborer could be provided with a house and lot, sufficiently large to furnish a good garden, by means of which the cost of living would be cheapened, and a consequent economy in the production of all manufactured articles would be effected. This point is 90 miles from the mountain, 19 from the coal field, and 25 from St. Louis.

The cost of the transportation necessary to the production, at this point, of one ton of iron, and delivering it in St. Louis, will be from the foregoing data, as follows:

For 2.22 tons ore, carried ninety miles, at five cts. per ton per mile,	-	-	-	-	-	-	\$9 99
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For three tons coal, carried nineteen miles, at five cts. per ton per mile, 2 85

For one	do.	iron	do.	25	do.	do.	do.	do.	1	25
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Total, - - - - - \$14 09

The cost of transportation, per ton, upon the supposition that the manufacture was carried on at the mountain, was found to be - - - \$22 10

Difference in transportation, per ton, in favor of the position at the Maramec, - - - - - \$8 01

Assuming, then, that the manufacture of the iron, through its different stages to that of bars, will be at the Maramec, and that the revenue, per ton, to the road, for transportation, will be as above estimated, the total annual amount of iron necessary to be produced to make up the whole deficiency of revenue, as estimated, will be \$251,460 97 ÷ 14,09, or 17,846 $\frac{3}{4}$ tons. The pigs, made from the ore of the Iron Mountain, will lose about 25 per cent. in their conversion into bars; and to make 17,846 tons of bar iron would, therefore, require 23,795 tons of pig metal, to produce which, would keep in constant operation twelve blast furnaces, yielding forty tons of pigs per week, or 2,000 tons per annum. Each of these furnaces, together with the forges, rolling mills, and other machinery necessary to convert the pigs into bars, will not cost less than \$50,000; or \$600,000 in all.

The State owns no part of the mountain, neither can it exercise any control over the quantity of iron to be produced. This must all be left to individual enterprise, and it appears, therefore, almost indispensable to insure a sufficient and certain supply of this article to the road, that the persons engaged in its manufacture, should, also, be largely interested in the improvement by which its transportation is to be effected, and that the State should not, in any event, do more than give its aid, by a liberal subscription to the stock of such an association, as might, in good faith, undertake its construction.

The maps and profiles of the survey for the Iron Mountain Rail Road, and for the Salt River improvement, have been completed, and those of the other surveys are in progress and will be finished with all possible expedition. These will present a minute delineation of the topography of the country explored for the route for the rail road, and of the valleys of the different streams surveyed.

OF THE OTHER DUTIES DEVOLVED UPON THE CHIEF ENGINEER.

Section 5 of the Internal Improvement Law, provides, "That it shall be the duty of the Chief Engineer to cause to be compiled, on a suitable scale, a large and correct map of this State, showing thereon, in a correct and minute manner, the geographical, topographical and geological features of the country, together with marginal notes of proper tabular form, containing all such information as may be considered useful to the citizen, or tending to the development of the resources of the State."

By permission of the Surveyor General of this District, to whom early application was made for that purpose, copies have been taken of all surveys of public lands within this State, that have been returned to his office; these, together with such additional information as has been obtained by surveys made by this department; and by the answers received, in part, to the queries addressed to every Postmaster within the State, (a copy of which is hereto annexed, marked B.) are being compiled in a sectional map of great accuracy, and on which, also, all confirmed claims will be delineated. It is proper to remark, that the survey of the boundaries of those counties that are bounded by minor water courses and by high lands, and dividing ridges not having been made, it is impossible to delineate their limits except approximately, and the suggestion is here made, whether it would not be advisable, not only on this

account, but also for consideration affecting the administration of the laws, that the duty of having these surveys made should be imperative upon all counties thus situated.

Article 2, section 6, provides, that "In the office of the Chief Engineer shall be daily kept a diary of regular meteorological tables." The performance of this duty would have compelled the addition of another member to the corps of engineers, which, together with the purchase of the necessary instruments, would have materially diminished the amount of the appropriation, which, it was early anticipated, would be barely sufficient to complete the surveys, &c., directed to be made. This duty has, therefore, been omitted.

In performing the duty devolved upon the Chief Engineer, by that part of the 4th section requiring him "to recommend what, in his opinion, may be necessary to the welfare of the State," he begs leave to say, that he believes the interest of the State, and the welfare of all, could in no way be so effectually promoted as by carrying out the enlightened and patriotic intention of the people of this State, who, in framing their constitution of government, were careful so to constitute it as not only to afford equal protection to all, but to secure, also, as far as possible to the same exertion, industry and economy in one section of its territory, the same remuneration that it obtains in another, by declaring, in that instrument, that "works of internal improvement shall forever be encouraged by the government of the State." This injunction upon the legislative action of the State, is of twenty years standing, and, as yet, it has not, within all its borders, any work of internal improvement;—not a single obstruction has been removed to the navigation of any of its waters;—its streams, except in a few instances, are without bridges, and its roads are as nature made them.

The great elements of wealth are the productive energies of nature, aided and modified by, and combined with, human industry. The rich prairie, the timber of the forest, the power that in the rivers is running to waste with a perpetual flow, the mines and minerals that abound in the earth—all are valueless unless combined with the labor, and modified by the intelligence, of man. And it is not enough for the State that she has a domain more extensive than any other in the Union, nor that her soil is more fertile, and her mineral wealth far greater, nor that her rivers are the fathers of waters;—all these natural advantages are but additional inducements to the exercise of that constitutional duty, which, by reducing the cost of transportation, and facilitating intercommunication, shall draw within its borders the industrious of every country, and lead to the cultivation of all its soil and the development of all its resources.

Very respectfully, your ob't. serv't.,

WM. H. MORELL, *Chief Engineer.*

CITY OF JEFFERSON, Dec. 15th, 1840.

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